NETWORK WORLD

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Westinghouse mulls AT&T Tariff 12 bid

By Bob Wallace
Senior Editor

PITTSBURGH — Westinghouse Electric Corp. is expected to decide next week whether to sign up for a multiyear, fixed-price custom network proposed by AT&T under Tariff 12.

Westinghouse is also considering bids from MCI Communications Corp. and US Sprint Communications Co. to replace its 1,000-site voice network. The network includes seven AT&T System 85 private branch exchange nodes, two Northern Telecom, Inc. central office switch nodes and 120 T-1 trunks.

Westinghouse hopes to reduce the costs of its long-distance service by signing a three-year, fixed-price contract with one of the carriers.

The company would not detail the proposals or the value of the network contract; however, David Edison, executive vice-president of Westinghouse Communications Systems, acknowledged that AT&T had approached Westinghouse with a Tariff 12 proposal.

Westinghouse Communications Systems provides communications services to its parent company.

AT&T declined to comment on its dealings with Westinghouse.

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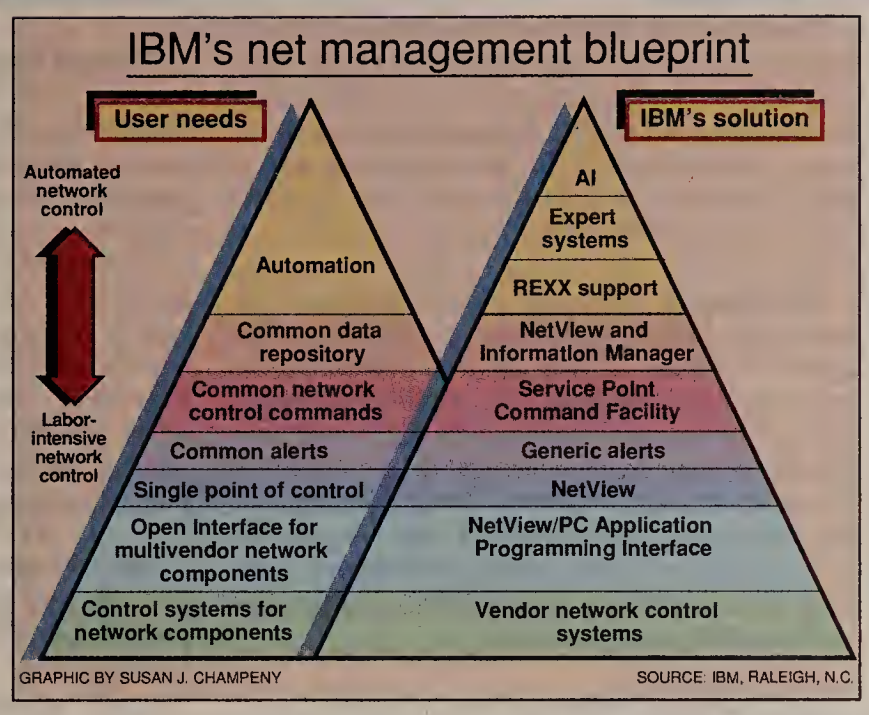

IBM officials chart future net management course

Top network management execs detail R&D efforts, future strategy in exclusive interviews.

By Paul Desmond
Staff Writer

RALEIGH, N.C. — In candid interviews with *Network World* last week, IBM officials presented a status report on NetView development efforts and charted future directions for the integrated network management system.

IBM said its plans are on track to automate NetView control features and bring Open Systems Interconnection and Transmission Control Protocol/Internet Protocol networks under NetView.

IBM also defended NetView/PC, which it said has been misunderstood. NetView/PC Release 1.2, which runs under OS/2, gives third-party vendors more memory to work with than previous releases and should spur new application development, said Gregory Smith, NetView/PC vendor liaison.

In addition, the new release will enable users to support several net management subsystems. Previous versions required users to purchase NetView/PC for each subsystem.

Jim Shaughnessy, IBM's manager of network product planning, said the company is working to provide artificial intelli-

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HP, 3Com team in LAN Manager effort

Vendors enter into strategic alliance to bridge OS/2 and Unix versions of local net software.

By Laura DiDio
Senior Editor

NEW YORK — Hewlett-Packard Co. and 3Com Corp. last week joined forces to integrate their respective Unix and OS/2 versions of LAN Manager.

The goal of the partnership is to enable workstation users to access resources transparently within Unix and OS/2 LAN Manager environments.

The alliance calls for the companies to create new LAN Manager products, unify their Transmission Control Protocol/Internet Protocol products and jointly develop electronic mail and network management applications.

HP will market 3Com's OS/2 LAN Manager as part of the deal, and 3Com will use HP's worldwide maintenance organization to support customers.

As a sign of its commitment to the relationship, HP will purchase up to 5% of 3Com's common stock, a transaction worth as much as $38 million.

The relationship benefits both companies. For HP, the deal will make it the only major computer vendor to support the integration of Unix and OS/2 LAN Manager. HP users, many of which are in the scientific and engineering sectors, will be able to link their Unix-based networks to OS/2 local nets.

For 3Com, the alliance gives it a scalable server architecture,

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Switched 56 alters rules of the game

By John Cox
Senior Editor

The advent of low-cost, high-speed, switched digital data services promises to offer a viable alternative to traditional switched and dedicated 56K bit/sec facilities and change fundamental assumptions about network design.

Both MCI Communications Corp. and US Sprint Communications Co. recently announced dial-up 56K bit/sec services priced up to 88% less than AT&T's Accunet Switched 56.

In many instances, it will also be less expensive to establish 56K bit/sec links and maintain them throughout a business day than to use AT&T's leased Dataphone Digital Service (DDS).

Besides offering potential cost

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NETLINE

NEWSPAPER

FEATURE

High-speed modems add new zip to market race

By Bruce Guptill
Features Writer

Modems are a lot like automobiles. Both have been around for decades. Development in both has continued at a steady, rapid pace, with size decreasing and power and speed increasing. And in both cases, the most expensive ones perform the same functions as the everyday models — but they do it at faster speeds and at much higher prices.

One can even find the two in the same locations. International Speedway Corp., headquartered in Daytona Beach, Fla., manages auto racing tracks in the southern U.S. With hundreds of thousands of customers paying millions of dollars every year to attend its races, International Speedway has a large volume of transactions

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ISDN service lets travelers book rooms from airport

Harrah's Reno bets Guest Service Center will lure customers to hotel, casino by eliminating wait.

By Barton Crockett
Senior Editor

RENO, Nev. — One of Nevada's biggest hotels, Harrah's Reno, has cut over an Integrated Services Digital Network-based customer service system that lets travelers book rooms from the local airport.

Harrah's Guest Service Center was unveiled at the Reno Cannon International Airport here last week. The Guest Service Center is a kiosk equipped with a full-motion video screen and three touch-screen computer monitors. Travelers can view available rooms on the touch-screen monitors while using the full-motion video link to reservation agents to check into the hotel.

The hotel is working with Nevada Bell and AT&T Network Systems Group in the ISDN trial. The Guest Service Center is supported by a 45M bit/sec fiber link that carries video signals and three ISDN Basic Rate Interface lines.

Harrah's is a 500-plus room hotel with casinos that handle about $3 billion in wagers a year. Rather than waiting in long lines at the hotel front desk, travelers will be able to check in quickly at the airport kiosk, hotel executives said. The executives say they hope the kiosk will improve customer service and lure more vacationers to its rooms and gambling tables.

The kiosk lets the hotel forward a picture of a traveler to waiting bellhops. Using this photo, bellhops can intercept travelers as they step off a Harrah's airport shuttle and quickly escort them to their rooms.

"We are a four-star, four-diamond property," said Bob Miller, the hotel's vice-president for marketing. "We hope this gives us incremental [increases] in business from the added convenience of being able to check in faster."

The flashiness and convenience of the kiosk will help Harrah's attract travelers that come into the airport without plans for accommodations, Miller predicted. "Of people arriving at the airport, 20% to 25% don't yet know where they want to stay," he said. "The Guest Service Center gives us the opportunity to win some of these travelers from the competition."

To use the service, travelers choose from a menu on a touch-screen monitor that lets them book rooms or view information

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AT&T introduces private packet-switching service

Switching equipment housed at AT&T CO sites.

By Bob Brown
Senior Writer

BASKING RIDGE, N.J. — AT&T last week announced a private packet-switched network service that eliminates the need for users to locate packet switches on their premises.

AT&T is aiming to win new customers with the service but expects some large users of its public packet network to migrate to the service as well, a company spokeswoman said.

The carrier will offer its Private Packet Network Service by partitioning packet switches at its switching offices to support groups of users. AT&T will provision these switches around the country based on demand.

The service is designed to help users save on the initial capital outlay and ongoing maintenance expenses associated with buying packet switches, said Larry Reiher, marketing manager for the service. "We think this is an important service because it gives customers the flexibility to grow their packet networks in small pieces," he said. "They can implement private nets from a small scale to a very large scale with fully dedicated components."

With the service — for which AT&T will file a tariff in March — the carrier will let users rent ports on its central office-based packet switches in four- or eight-port increments, Reiher said. Users can access the service via digital or analog facilities, whether switched or dedicated, which AT&T will provide through local telephone companies.

Customer traffic will be routed between AT&T serving offices via user-specific lines that will typically run at 56K bit/sec. The 9.6K bit/sec rate can be used for less demanding communications. This differs from public packet-switched networks, such as AT&T's Accunet Packet Service, in that the transmission facilities will be dedicated to the user from serving office to serving office and possibly beyond that if the user chooses dedicated access lines, Reiher said.

The service will support X.25 as well as a number of other asyn-

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Briefs

MCI loses FTS 2000 protest. The U.S. General Services Administration's Board of Contract Appeals last week dismissed MCI Communications Corp.'s protest of AT&T's Federal Telecommunications System (FTS) 2000 contract award. The GSA awarded 60% of the FTS 2000 contract to AT&T in December.

The board said MCI did not have the right to file a protest since it was not a primary bidder on the contract. MCI was a subcontractor in a losing bid headed by Martin Marietta Corp. The carrier protested because AT&T refused to disclose its bidding prices. AT&T's portion of the FTS 2000 contract is worth an estimated $15 billion over 10 years.

Bowing to pressure. Under pressure from state and federal regulators, Nynex Corp. has agreed to refund its New England Telephone Co. and New York Telephone Co. subsidiaries nearly $50 million for overcharges by its purchasing unit. The move came amidst a Federal Communications Commission audit of Nynex Materiel Enterprises Co., which has been accused of overcharging Nynex's local telephone companies for network equipment such as switches during 1988, a spokesman for the holding company said.

GTE takes orders. Eurpac Service Co. recently signed on as GTE TeleMessager, Inc.'s first interactive voice response (IVR) service bureau customer. Eurpac, an international provider of food and commodities to U.S. military commissaries, will use GTE TeleMessager's IVR to automate its order-entry system. Sales personnel will use the service to enter orders into a central data base using the keypad of their push-button telephone. Manufacturers and distributors will poll the data base to retrieve orders. Previously, clerks manually transcribed orders taken over the telephone and used facsimile machines to send the information requested.

Tough talk. The U.S. government last week targeted South Korea and the European Economic Community (EEC) as priority regions U.S. negotiators will focus on in an effort to break down trade barriers to U.S. telecommunications equipment and services.

Under the terms of the Omnibus Trade and Competitiveness Act of 1988, the U.S.will try for one year to convince South Korea and the EEC to ease import restrictions before trade sanctions will be considered. The sanctions could include tariffs and a ban prohibiting the U.S. government from purchasing communications equipment and services from these countries.

Novell widens support options. Novell, Inc. last week said it will offer new service and support options to its major customers through relationships with four major service organizations. Hewlett-Packard Co., Xerox Corp., BancTec, Inc. and Federal Technology Corp. are now authorized by Novell to sell service and support plans. According to Novell, the third-party service program will enable NetWare users with multiple sites to obtain consistent nationwide or even worldwide service.

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AT&T upgrades net management and report capabilities of SDN

By Bob Wallace
Senior Editor

BASKING RIDGE, N.J. — AT&T last week announced that it has improved net management capabilities and repackaged a variety of usage and performance reports for its Software-Defined Network (SDN) service.

AT&T's Expanded Service Management System (ESMS) enables a user to control its SDN service from a terminal at the customer's premises linked to an adjunct computer at the central office over a 9.6K bit/sec private line.

With ESMS, the user can set up, change and delete authorization codes; authorize use of capabilities such as international dialing by caller or by group; and activate SDN's flexible routing feature.

Flexible routing enables the user to redirect traffic from one SDN site to another. For example, a user could have calls to an East Coast sales office routed to a West Coast office after the East Coast office is closed. A user can set up a recording notifying callers that their calls are being rerouted. Currently, in order to make such service modifications, SDN users must call AT&T's SDN Control Center in Atlanta.

AT&T will charge SDN users a $100 monthly fee for ESMS, which is scheduled to become available April 1.

Call detail, net usage reports

AT&T also revised its Network Information and Management arrangement, which packages SDN management reports containing call detail data and network usage summaries. The reports help users track and bill departments for SDN costs, identify network traffic trends and review network performance.

Under AT&T's Network Information and Management arrangement, users will receive either bill detail or call detail information in tape format, along with monthly network traffic summaries, traffic summaries by location, point-to-point traffic summaries, network and off-network calling reports by location, and summaries of calls by authorization code.

In addition, users can request access line status and schedule transmission tests under the new arrangement. All reports will be sold together under contract arrangements that AT&T would not discuss. Currently, users buy the reports on a per-call record or per-report basis.

About 70% of AT&T's SDN customers have already signed up for ESMS, according to a spokeswoman. She would not say how many companies currently use SDN.

SDN provides users with the benefits of a private network, although traffic is actually carried over the public switched network. SDN supports such features as a uniform seven- or 10-digit dialing plan for sites on the network.

FCC price cap plan gets boost from new study

By Wayne Eckerson
Staff Writer

SANTA MONICA, Calif. — The RAND Corp. last week issued a report endorsing price caps, saying the regulatory scheme would prevent users from "shouldering the multibillion-dollar installation cost" of fiber-optic networks.

The report, entitled "Price Caps in Telecommunications Regulatory Reform," is a shot in the arm for the Federal Communications Commission's controversial price cap plan. The FCC has scheduled a vote for March 16 on whether to implement price caps for AT&T and local exchange carriers.

According to the RAND study, price caps would promote "more vigorous long-distance competition" by giving AT&T greater pricing flexibility. They would not lead to a decline in service quality, as some critics have predicted. Price caps would also improve the efficiency of carrier networks and reduce the administrative costs associated with complying with rate-of-return regulation.

The report was funded by RAND, a nonprofit research center, and The Markle Foundation, a nonprofit organization that provides grants for telecommunications research.

The study said phone companies are building fiber-optic networks with the expectation that U.S. District Court Judge Harold Greene and the FCC will soon lift line-of-business restrictions and allow them to offer new services such as cable television. Unless price caps are adopted, users could end up financing these operations, the report said.

"Some fear that companies will invest tens of billions [of dollars] in fiber networks that will be paid for by telephone subscribers," said Leland Johnson, author of the report and senior economist at RAND. "One of the most important advantages of price caps is that they put a ceiling on basic phone rates to protect consumers from such cost shifting.

In monopoly situations, such as intrastate services, price caps will provide incentives for carriers to increase profits by reducing costs instead of raising rates, Johnson said.

Price caps would also drive long-dis-

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SEE US AT INTERFACE '89 BOOTH #1351

CeBIT conference to host OSI network demo, ISDN user meet

NetWorld Europe 89 will be held in conjunction with CeBIT.

By Bruce Guptill
Features Writer

HANNOVER, West Germany — This year's Hannover Fair CeBIT '89 network and computer exposition, which gets under way in two weeks, will host CeBIT's first ISDN user conference and the largest-ever European OSI demonstration.

Being held in conjunction with CeBIT, which runs March 8 to 15, is NetWorld Europe 89, the first international exhibition by vendors of Novell, Inc. NetWare-compatible products.

The CeBIT show's U.S. coordinator, Hannover Fairs USA, Inc. of Princeton, N.J., claims that more than 400,000 attendees from 90 countries flock to Hannover each year to examine the wares of 2,500 vendors from the U.S., Europe, Asia and Africa. The show fills 10,557,855 square feet of exhibit space in 24 halls.

At least three halls are devoted entirely to communications hardware and software, including one all-U.S. exhibit area featuring such vendors as Retix, Communication Machinery Corp. and Vitalink Communications Corp.

A separate U.S. pavilion, sponsored by the U.S. Department of Commerce, contains exhibits from other U.S. firms as well as booths from several states looking to attract foreign manufacturers and investors. IBM, MCI Communications Corp., AT&T and Nynex Corp. are exhibiting in independent areas.

EurOSInet

One of the highlights of the CeBIT conference is expected to be the EurOSInet demonstration, which is similar in concept to last June's Enterprise Networking Event '88 International in Baltimore.

In the week-long interoperability demonstration, eight user organizations at the show and other locations will work with Open Systems Interconnection products from 24 vendors and services provided by three international telecommunications carriers. The users include BASF Corp., Dresdner Bank, AG, Electricite de France and the governments of the UK and France.

Major vendors participating include IBM, Hewlett-Packard Co., Digital Equipment Corp., Data General Corp., Siemens AG, Unisys Corp., AT&T, France's Transpac and Kokusai Denshin Denwa Ltd., the Japanese Post, Telegraph and Telephone administration, which will be providing communications services. The exhibit is sponsored by the EurOSInet group, the European OSI user forum and the European Commission.

The demonstration will support com-

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Voice message group opts for digital standard

By Bob Brown
Senior Writer

BOULDER, Colo. — A group trying to develop a protocol to network voice mail systems from different vendors last week said it decided to base the specification on digital rather than analog technology, as it originally planned.

In balloting concluded late last month, the 30-member Audio Messaging Interchange Specification (AMIS) group voted 19-9 (two members did not vote) to support development of a digital voice mail network protocol.

Members of the group, which include voice mail users, service providers and manufacturers, have been debating since the group's formation last September whether to develop an analog protocol, a digital protocol or both.

The specification will detail rules for transmitting signaling information and recorded messages between different voice mail systems. Eventually, the protocol will let users send a message to one or more voice mail systems, and reply to or redirect a message across heterogeneous systems.

Although the vote in favor of the digital approach garnered the two-thirds majority needed for acceptance, the group will attempt to reconcile differences with the nine dissenting members at a March 2 meeting in San Jose, Calif. AMIS had originally leaned toward analog technology.

The meeting will be held prior to the Voice '89 Conference & Exposition, a trade show focusing on the voice processing industry to be held March 6 to 8 in Santa Clara, Calif. Several AMIS members will be speaking at Voice '89 on AMIS-related topics.

The need for AMIS is increasing as users begin to employ voice mail systems for sending batches of voice messages to dispersed parties instead of just using them as answering machines, according to Jerome King. King is manager of telecommunications applications for the corporate telecommunications department of General Electric Co. in Bridgeport, Conn.

The need has been exacerbated by an increase in corporate acquisitions and joint ventures, which has created the desire to integrate different voice mail systems, King said.

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Prime bolsters EXL micro, adds NCS, TCP/IP support

By Laura DiDio
Senior Editor

NATICK, Mass. — Prime Computer, Inc. last week said it has begun to migrate its Unix-based EXL supermicrocomputer to a client/server net architecture.

Prime last week said it will license Apollo Computer, Inc.'s Network Computing System (NCS) for its EXL line. NCS is a set of software tools that allows users to distribute parts of an application to multiple net servers, thus improving processing time.

Prime said it will also enhance support for Transmission Control Protocol/Internet Protocol on the EXL line. The company will provide EXL users with electronic mail, virtual terminal and file-transfer features that support TCP/IP.

Within two months, Prime will introduce a low-cost, entry-level Unix server aimed at local nets with fewer than 10 nodes.

The announcements come just two weeks after Prime and Novell, Inc. said they will jointly develop the first Unix-based version of NetWare ("Prime, Novell to jointly build Unix-based NetWare," *NW,* Feb. 13). Under the agreement, Prime and Novell will develop two versions of NetWare, both of which will run on the Unix-based EXL server.

All of the moves by Prime are part of its broad, long-term strategy called Solutions for a COordinated Resource Environment (SCORE). This program advocates a client/server setup, in which applications can be distributed to servers with available processing time.

Under Prime's current network strategy, EXL users are restricted from splitting up applications and distributing them across various network servers.

Prime's decision to license NCS gives users the file-transfer capabilities needed for a client/server architecture, said Brian Ritchie, director of marketing for Prime's entry-level systems.

"Under our old terminal/host strategy, an application was typically relegated and confined to one server, which was usually overloaded. Users got slow response time," Ritchie said.

Similarly, the TCP/IP enhancements will provide users with capabilities and functionality needed in a client/server domain.

Prime's first TCP/IP addition is a mail facility for Unix networks running the protocol. It supports the Simple Mail Transfer Protocol (SMTP), which will let EXL users exchange messages with other SMTP systems connected via TCP/IP.

> The decision to license NCS gives users the file-transfer capabilities for a client/server architecture.
>
> ▲▲▲

The second protocol enhancement is the addition of Streams, a software facility that enables developers to write applications, such as X.25 connections, for TCP/IP-based systems.

Lastly, Prime will support the Transport Level Interface (TLI) software. TLI is a relatively new software interface that lets software applications such as AT&T's Remote File Sharing access facilities and applications on remote systems or nets, Ritchie said.

At your servers

The expected entry-level Unix server is being positioned as a low-cost server that can be used to connect users to Prime's larger processors.

"We're giving users a cost-effective entry point into the Unix world. Before this, our EXL servers were only cost-effective for users with 10- to 50-node LANs," Ritchie said.

The as yet unnamed EXL server will pack 3.2 million instructions per second (MIPS) and will cost less than $10,000. It will be introduced in the second quarter and will be fully compatible with the EXL 320 Unix server at 4 MIPS and the EXL 325 Unix server at 5 MIPS.

Spectrum Systems to introduce latest XCOM 6.2 APPC software

New version of network package runs in background mode.

By Susan Breidenbach
West Coast Bureau Chief

BOSTON — Spectrum Concepts, Inc. is expected to announce this week a new version of its XCOM 6.2 communications software that enables users to run the program in background mode while they work on other tasks.

XCOM 6.2 is Advanced Program-to-Program Communications software that utilizes IBM's LU 6.2 protocol and provides peer-to-peer connectivity among personal computers, minicomputers and mainframes from a variety of vendors.

XCOM 6.2 Version 1.5, which will be announced at the NetWorld '89 Boston show, runs on DOS-based personal computers. It consumes 100K bytes of system memory, 50% less than previous versions. Version 1.5 is a memory-resident application, which means it can run in background mode while users operate other applications on their screen.

Users can continue to work with word processors, spreadsheets or other applications while XCOM 6.2 handles file transfers and related functions, including ASCII-to-EBCDIC conversion, data security and error detection.

Spectrum Concepts has also improved the product's user interface, adding a better graphics management screen that supports multiple windows. Other new features include hot key-generated status reports on file transfers and the ability to prioritize file-transfer sessions in a queue.

XCOM 6.2 can be used across any local network that supports IBM's Network Basic I/O System. Spectrum Concept's APPC product runs on the server. Each attached workstation must also run a portion of the APPC software; however, the server handles the actual file transfer.

The software also includes drivers for a number of popular Systems Network Architecture gateways.

XCOM 6.2 supports bidirectional file transfer between a personal computer and host. Although many 3270-based applications let a personal computer user transfer files in both directions, the personal computer has to initiate the file-transfer session. By contrast, XCOM 6.2 lets the host initiate file transfers as well.

Spectrum Concepts markets versions of XCOM 6.2 for IBM mainframes running MVS or VM, IBM's System/3X and Application System/400, Digital Equipment Corp.'s VAX, AT&T's 3B2 and workstations from Apollo Computer, Inc. and Sun Microsystems, Inc.

Prices range from $475 for the personal computer version to $34,000 for mainframe configurations.

Microsoft builds LAN Manager 'turbocharger'

By Susan Breidenbach
West Coast Bureau Chief

REDMOND, Wash. — Microsoft Corp. last week said it is building a so-called turbocharger that will boost the performance of its OS/2 LAN Manager by more than 100%.

Speaking here at the Microsoft System Developers' Conference, company officials also said that, later this year, they will deliver to developers a tool kit that will allow them to write OS/2 applications for Intel Corp. 80386-based systems.

Microsoft plans to ship a new version of OS/2 for 80386 workstations and servers in 1990, with a 80386-based LAN Manager version due out sometime later. Those products will increase LAN Manager's performance, making it possible for users to support multiple protocol stacks concurrently on the same server while allowing the server to handle large data bases.

"The top priority in OS/2 Standard Edition development is to exploit the 386 architecture," said guest speaker Lee Reiswig, director of software strategy for IBM's Entry Systems Division. Several Microsoft executives echoed Reiswig's sentiment and indicated that OS/2 LAN Manager's turbocharger will introduce many of the performance enhancements forthcoming in the 80386-based OS/2 version.

Turbo power

LAN Manager users should expect the 80386 turbocharger by year end. The turbocharger will enable them to take advantage of some of the features of the 80386 architecture, said Rob Glaser, director of marketing for Microsoft's Network Business Unit.

While Microsoft's current LAN Manager software is written for 16-bit systems, the turbocharger will be able to process data in 32-bit increments, enhancing LAN Manager's performance on 80386-based workstations and servers.

Microsoft is rewriting a portion of LAN Manager's OS/2 instructions to run at 32-bit speeds, rather than at OS/2's current 16-bit setup. This software modification will enable 80386-based processors to execute LAN Manager commands and programs faster than the current operating system software permits.

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Bruce Sobolov, Director,
Equipment Planning and Administration,
Election & Survey Unit, CBS News

Laura Gismondi,
Account Executive,
AT&T Data Systems Group

Bruce Goldberg,
Area Technical Manager,
AT&T Data Systems Group

Skating between terminals put ruts in the rug.

Bruce Sobolov of CBS News, Laura Gismondi and Bruce Goldberg, AT&T, savor the afterglow of their own post-election victory. They take us behind the scenes for a glimpse at some of the reasons why CBS was successful on election night.

FEBRUARY 15, 1989

AT&T: Afterwards, the critics said CBS was the best, the fastest.

CBS: Right, but we sweated it out for more than a year. With more 20-hour days than I care to remember.

AT&T: Your situation was pretty complicated.

CBS: We were faced with election projections, exit-poll analysis, and other studio programming applications running on IBM hosts.

AT&T: Plus the NewStar system we tied in with our wide-area network, ISN. It's distributed networked computing. Hey, we thrive on this stuff.

CBS: We're impatient around here. Speed is the only way you succeed with election coverage. The first thing we did was provide multi-host access with the 6500 System. Last election, everybody who needed access to two systems used two terminals. Twice the space, twice the cable, additional controllers, added expense, and wasted time.

We had programmers working simultaneously on three host applications, two bisync, one SDLC. They were constantly skating between terminals, wearing ruts in the rug. Now they have access to multiple sessions simultaneously from one terminal.

AT&T: The data moves over twisted pair, the same type wiring the technicians pulled for your System 75 PBX. That made sense.

CBS: An added advantage was having the same dedicated AT&T technicians installing and maintaining our system, providing consistency to my operation.

AT&T: But really, Bruce, why us?

CBS: Your responsiveness. At CBS, we all agreed that what we needed was someone who could deliver it fast, install it, test it, and support it. And you were hungry. You never said, "No, we can't do it." And you never took long to say "yes."

AT&T: You had computer networking problems. Solving them is the house specialty.

CBS: We do distributed computing to the nth degree. Our reporters are all over the country. They call in their results when the precinct closes. Before, we had over a hundred operators standing by, with phones and terminals. That election night we introduced the voice response system running on AT&T PCs.

AT&T: How many calls?

CBS: Thirty, thirty-two calls at once, reporters everywhere having voice response conversations with the IBM host. And all done with the same custom host software we always used. We greatly reduced our cost.

AT&T: The other networks are watching, thinking, "How come CBS has the results already and we don't?"

CBS: It was a good night for us. Now the name of the game is streamlining for 1990. We're talking about a networked computer solution as a gateway into different host systems.

AT&T: With the AT&T Systems already up, running, and in place, we can almost completely automate your survey system.

CBS: That's a real big plus for all of us.

AT&T: Something tells me I've seen that same glint in your eye before. (Laughter)

The CBS Solution:

THE CHALLENGE:

Integrate IBM and DEC host computers and NewStar editorial system. Build an advanced computerized voice response system to speed election-night projections.

THE SOLUTION:

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THE RESULT:

CBS News provided fast, accurate election coverage throughout Campaign '88. The *Baltimore Sun* reported that, "CBS was recording results in all sorts of key races faster and with far more authority than either of the other networks."

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4. Can you *easily* add users, nodes and new applications? Yes __ No __

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6. Does your *network management* maximize performance and control? Yes __ No __

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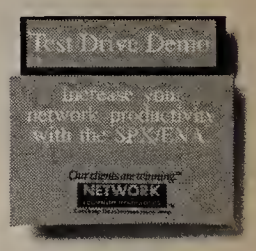

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Worth Noting

"The problem with this dynamic long-distance market, which is really exploding, is that you have an archaic process of regulation that provides a torture test every time you try to implement change or serve customers."

Larry Garfinkel
Vice-president
of marketing services
AT&T
Basking Ridge, N.J.

People & Positions

Mark Conlee has been named director of information services for **U.S. Intelco Network, Inc.**, a consortium that provides calling card services and other data management services to more than 600 independent telephone companies in the U.S.

Conlee will manage the company's computer center and its data entry, systems, programming and applications staff. He was previously manager and senior consultant with the manufacturing systems division of Weyerhaeuser Information Systems.

Northern Telecom, Inc. recently announced the appointment of **Michael Glenn** as vice-president of the Corporate Networks Operation, a joint business venture of Northern Telecom and **Hewlett-Packard Co.** that focuses on enterprise networks. Glenn will oversee Northern Telecom operations relating to sales and marketing. He was most recently vice-president of corporate network sales.

David Tolwinski was recently named vice-president of marketing and product development for **Interlan, Inc.** of Boxborough, Mass. Formerly vice-president of marketing, Tolwinski will also oversee engineering and product development.

IBM marks vertical marts for future product R&D

Big Blue expands operations at new facilities.

By Bob Brown
Senior Writer

PURCHASE, N.Y. — IBM recently announced that it is expanding its efforts to develop products designed to meet the needs of users in specific industries such as banking, insurance and manufacturing.

IBM said it will establish two laboratories and expand operations at two existing facilities to focus on developing software and hardware for customers in vertical industries. These operations will also provide systems integration services, customer education programs, and installation and support.

Through coordination with other IBM units, the laboratories will promote the development of industry-specific products, an IBM spokeswoman said.

IBM said it will reassign more than 2,000 of its 223,000 U.S. employees to the new operations, which will be fully operational by year end. IBM will also conduct limited hiring to fill jobs at the laboratories, the spokeswoman said.

"Today's announcement is a reflection of IBM's commitment to become more market-driven and to add value to our customers' operations," said Ned Lautenbach, IBM vice-president and general manager, application solutions, IBM U.S. Marketing & Services.

IBM's expansion plans include:

- A laboratory will be established in Charlotte, N.C., to develop products for customers in service industries such as banking, finance and insurance.
- A portion of IBM's Systems Integration Division laboratory in Manassas, Va., also will be dedicated to developing products for service industries and will work closely with the Charlotte laboratory.
- A lab will be established in Endicott, N.Y., to develop products

(continued on page 12)

INDUSTRY BRIEFS

US West Information Systems, Inc. and **Applied Communications, Inc.**, two subsidiaries of US West, Inc., last week said they have agreed to develop software that supports electronic benefits transfer (EBT) applications for users in state and local governments.

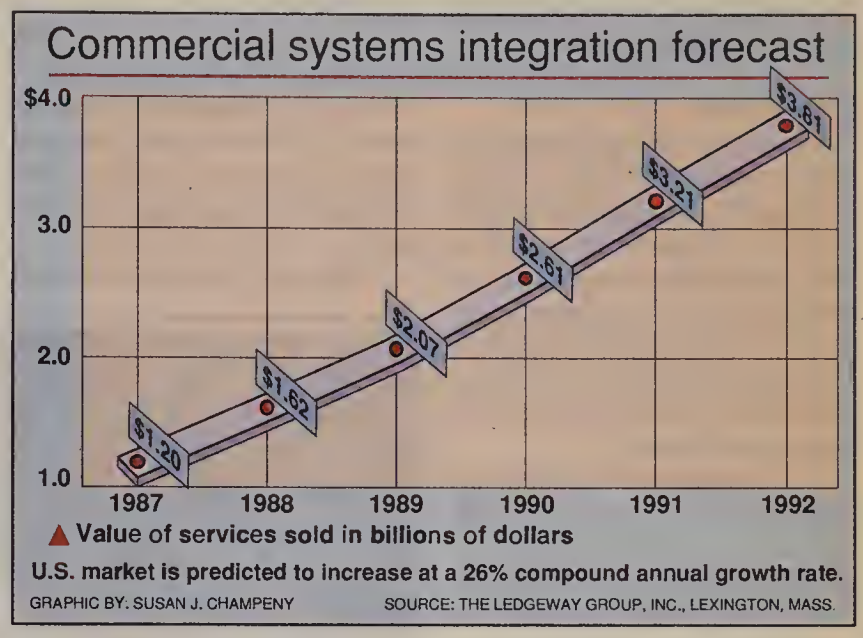
According to a spokeswoman for Applied Communications, the EBT systems will utilize existing funds transfer technology supporting automated teller machines and point-of-sale devices. Government aid recipients will be able to obtain cash and food stamp benefits using a debit card and a POS device.

The software is being designed for Tandem Computers, Inc. processors and will be based on Applied Communications' BASE24 electronic funds transfer product.

Contel ASC recently cut over its fourth shared-hub earth station for very small aperture terminal networks. The hub is housed at New York Teleport in Staten Island, N.Y. The shared hub allows commercial users to implement VSAT networks without incurring the cost of building and maintaining a dedicated hub.

The satellite network company also maintains shared hubs in Washington, D.C., Mountain View, Calif., and Charlotte, N.C. Contel ASC said it is supporting a T-1 fiber link between the Washington and New York facilities to ensure network availability. Contel ASC is based in Rockville, Md.

Digital Communications Associates, Inc. (DCA) last week said its 10Net local network software has been selected by **ISC Systems Corp.** of Spokane, Wash., as the local network software for ISC Systems' new personal computer-based branch automation system. The new branch automation system, called Pinnacle PC, will include DCA's 10Net local network software for Ethernet on MS-DOS-compatible personal computers. In the past, ISC Systems has used a proprietary local network communications software product for its offerings. The automation system is designed for use by financial services firms, an ISC Systems spokesman said.



Systems integration options on the rise

Major vendors and consulting firms fill a void for network assistance in the commercial market.

By Bob Brown
Senior Writer

The systems integration market is likely to heat up over the next few years as major vendors and consulting firms expand their efforts in the commercial arena.

In the past year, such major players as AT&T, Booz, Allen & Hamilton, Inc., Digital Equipment Corp. and IBM have either expanded or refocused their systems integration operations for commercial customers.

Vendors said they see a growing need among users for help in building and managing increasingly complex networks and data processing operations. They also see commercial systems integration as a way to increase service revenues and lock in large customers.

Analysts agreed that demand is rising among users for systems integration services.

According to Jeffrey Kaplan, a director at The Ledgeway Group, Inc., a Lexington, Mass.-based market research and consulting firm, the commercial systems integration market will grow from $1.2 billion in 1987 to $3.81 billion by 1992, a 26% compound annual growth rate.

"Our projections are actually conservative compared with some of the other market research firms," said Kaplan, whose firm defines systems integration as the tying together of dissimilar devices. (Other market research firms include services such as facilities management and custom programming in their definitions of systems integration, he explained.)

The influx of vendors into the market should be good news for users looking for help with major networking and information system projects, Kaplan said. There is a wider array of services available from a greater number of vendors, and increased competi-

(continued on page 12)

Enter the combatants

The commercial systems integration market has seen its share of activity among big name vendors over the past year. Among the announcements:

- **AT&T** last March formed its 500-employee Systems Integration Division. Through this division, AT&T provides consulting, net design and engineering, software development, installation and net management services, as well as maintenance and facilities management.
- **IBM** announced a Systems Integration Division in April under its Applications Solutions line of business to consolidate IBM's systems integration resources under one organization. The group aims to design and build turnkey systems for users from custom applications, IBM hardware and software, and other vendors' products.
- **Digital Equipment Corp.** last September announced its Enterprise Services and Network Enterprise Management Program, which it described as a foundation for its role as a systems integrator. DEC's systems integration offerings include planning, design, implementation and ongoing management.
- **Booz, Allen & Hamilton, Inc.**, a New York-based management consulting firm, last month said it was expanding the scope of its commercial systems integration business. The firm said it plans to spend between $4.4 million and $10 million a year over the next three years to boost its presence in this market.

NETWORK WORLD CHART

Integration options on the rise

continued from page 11

tion in the commercial sector of the market could lead to price wars in the future, he said.

Vendor view

In the past, major players in the systems integration market, such as Electronic Data Systems Corp. and Arthur Andersen & Co., tended to focus on government contracts. But as networks expand in size and the applications they support become more vital, vendors see great potential in the commercial market.

Vendors also view systems integration as a way to offset shrinking profit margins for hardware products, said Jack Epstein, a vice-president at International Data Corp., a Framingham, Mass.-based market research and consulting firm.

"Vendors recognize the need to generate more revenue from services," Epstein said. "Margins are getting smaller on hardware, and that is being exacerbated by the trend toward standard systems such as Unix and OSI networking. That takes away a major part of their [product] differentiation."

Systems integration can also help vendors lock in the business of large users, said Al Bentley, director of business planning and development in AT&T's 500-member Systems Integration Division.

"The more a customer sees of us, the better the chance that customer will follow up with us [for products and services]," he said.

Bentley said users are demanding systems integration services. "A lot of big commercial customers are going through the same things government users went through a while back," said Bentley, whose division was formed last March. "They can't keep up with all the technology. They want to run their businesses but let a technology company make assessments of the ins and outs of new products."

Paradox of growth

Ironically, growth in the commercial systems integration market may be slowed by the influx of major competitors, Kaplan said. User spending will be delayed as companies weigh the growing number of systems integration alternatives.

But that will not stop new vendors from entering the systems integration fray, according to vendors and analysts.

"There are not many things other than systems integration that hold the prospect of multiple million-dollar hits in the fairly near term and at a reasonable investment," Epstein said.

Systems integration also helps vendors venture into markets in which they currently have little

AT&T's Al Bentley

IBM marks vertical marts

continued from page 11

for customers in the manufacturing and process industries. This laboratory will focus on computer integrated manufacturing (CIM) applications.

■ The CIM operations at IBM's Systems Integration Division facility in Owego, N.Y., will be expanded to meet growing customer need in this market. Employees in the Owego facility will work closely with those in the new laboratory in Endicott.

According to Bill Gould, vice-president and head of equities research at New Japan Securities International, Inc. in New York, IBM has put more emphasis on meeting specific customer needs.

"Back in 1987, IBM identified that it had a problem, and it has worked to become more sensitive to customer needs," Gould said. "IBM's winning of the business of some banks indicates a certain success since that is a specific industry that nobody handles easily."

or no expertise, including the development of industry-specific applications, he said.

A vendor's ability to work with other firms to complement its strengths is the key to success as a full-service systems integrator, said David Creed, corporate marketing manager for Digital Equipment Corp.'s systems integration and professional services group. "No one can do everything in one place at one time," Creed said.

IBM has many resources, but it does not plan to do everything itself, explained Gerald Ebker, president of IBM's Systems Integration Division in Bethesda, Md.

IBM will lead some systems integration projects and be a subcontractor on others, he said.

As a rule, though, systems integration vendors will play to their traditional strengths, Ebker said. IBM, for example, will rely on its expertise in large systems and data base management, while DEC said it will leverage its expertise in networking. So-called independent firms, such as Booz, Allen & Hamilton, say their strength lies in the fact that they are not tied to any particular products.

Obstacles exist

Despite rosy forecasts, The Ledgeway Group's Kaplan said, there are obstacles for vendors to overcome in marketing systems integration services to users. Many companies have sizable communications staffs and are not ready to let a vendor take over their networks, he said.

AT&T's Bentley agreed that systems integrators must tread carefully on users' turf.

"If you go in and try to take over the network from the MIS manager, you're going to get your first and last contract at the same time," he said.

The systems integrators that win user contracts will be those that have both technical and consulting expertise and those that can point to successful projects in the past, Kaplan said.

"[We've] always felt that good service can bring in new business opportunities," Kaplan said. "Those vendors best [positioned] are those that already have a good reputation for service."

FCC defends price caps, adds changes

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — FCC Chairman Dennis Patrick recently submitted a letter to Congress defending the proposed use of price caps to regulate AT&T and local carriers but acknowledging that modifications could enhance the plan.

In the letter, which was requested by Congress, Patrick offered his rationale for adopting price caps, explained the mechanics of the plan and included details of new consumer safeguards.

The letter is the most recent development in an ongoing debate between Congress and the FCC on the merits of price cap regulation. Congressional pressure forced Patrick to delay a vote on price caps from late January to March 16. Congress had admonished Patrick not to push ahead with the plan until the legislators were confident that consumers would benefit.

Earlier this month, Rep. Edward Markey (D-Mass.) and three other members of the House Subcommittee on Telecommunications and Finance asked Patrick for information on changes that would be voted on in March. In an earlier letter, Patrick had conceded that some modifications to the plan might be needed to guarantee that consumers would benefit from price caps.

In his latest letter, Patrick outlined several changes that he said would ensure just and reasonable rates under price caps: A third category will be created for pricing residential services from AT&T; two other categories, one for 800 services and one for all other business services, will be kept; and prices cannot go up or down by more than 5% per year within those categories.

The new residential category will help protect against predatory pricing and give residential users greater assurances of low rates, Patrick said. Critics said the previous proposal with two pricing categories gave AT&T too much flexibility and could result in higher prices for less-competi-

(continued on page 61)

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Worth Noting

"AT&T didn't have volume discounts on even one basic service just a few months ago. Now they have discounts on virtually every service. Other carriers are jumping on the cart too."

Robert Self
President
Market Dynamics
A New York-based tariff analysis and network design firm

Carrier Watch

Cable & Wireless Communications, Inc. recently cut rates for its long-distance services and call-accounting offerings and restructured its Equal Access WATS service.

The Vienna, Va.-based long-haul carrier reduced rates for its interstate switched and dedicated access services an average of 5%, with the price of some calls dropping 21%.

Fees for its call-accounting and security features were reduced an average of 28%. The call-accounting feature available with the carrier's long-distance services enables a user to assign billing codes to employees, and the security feature enables a user to assign authorization codes to employees.

The restructuring of its WATS service, called Focus III, will produce an average savings of 5%.

Under the WATS restructuring, business users that spend an average of $125 to $7,000 a month now qualify for Focus III. Before, users had to spend at least $500 a month to use the service. Current Focus III customers will receive a number of service enhancements. Cable & Wireless Communications has expanded the Focus III discount schedule by lowering the minimum usage requirements for volume discounts from $500 a month to $150 a month. Dis-

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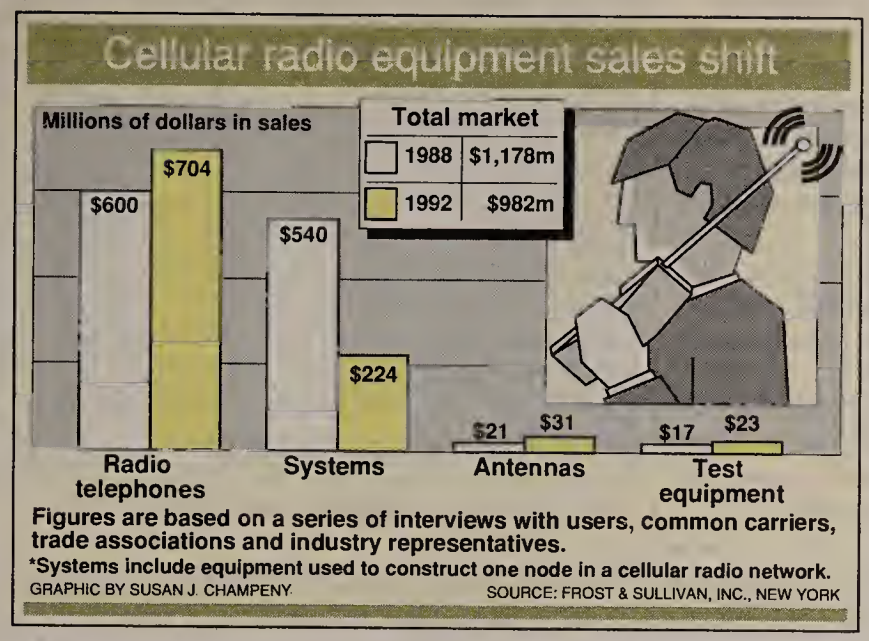

Users overlook potential savings from local telcos

'Flexible' tariffs can provide major cost benefits.

By Jim Brown
New Products Editor

NEW ORLEANS — While many users are wondering if they can take advantage of AT&T's Tariff 12 and Tariff 15 custom network offerings, they may be overlooking potential savings through special arrangements with local carriers.

"Many [local exchange tariffs] are written to have much more flexibility than you think," said Henry Levine, a partner with the Washington, D.C.-based law firm of Morrison & Foerster, in a presentation at the recent American Bankers Association's Telecom '89 conference here.

In fact, many local operating companies have special tariffs that can be used to offer custom network pricing. For instance, some local operating companies are allowed to offer what are known as special construction tariffs and limited service offerings.

Special construction tariffs are used to price such things as installation of temporary telephone circuits for conventions and other functions. Limited service offerings enable local operating companies to meet specific user needs not covered by other tariffs.

Tariffs by persuasion

But, Levine said, users may be able to persuade local operating companies to employ these tariffs to offer custom pricing for new or existing services.

A local operating company may seek approval for a custom arrangement from a public utility commission if the user has threatened to go to a local exchange bypass company or to install private network facilities to support the service.

For example, the New York-based Securities Industry Association (SIA), a group of Wall Street companies, pitted New York Telephone Co. and five other vendors, including New York Teleport, against one another to obtain the best price for a 10,000-line intralocal access and transport area private network. Under a limited-service offering tariff, New York Telephone was awarded the contract to install the net.

That network is expected to reduce voice communications costs by as much as 42% and will eventually support data and video services ("NY Tel awarded contract to build securities network," *NW,* Dec. 26, 1988/Jan. 2, 1989).

Special requirements

In order to attain special tariff rates, Levine said users must convince their local operating companies that there are special customer requirements that cannot be met by existing tariffs. Being a big user that spends a lot of money on network services can be something of a special customer requirement by itself, he said.

Levine admits, however, that it is difficult to obtain special pricing on switched services.

Some local operating companies have had more success than others in obtaining approval for special tariffs, he said.

"Southern Bell [Telephone and Telegraph Co.] has been successful with its public utility commission," Levine said.

Likewise, Nynex Corp. and Pacific Bell have been able to show public utility commissions that there is substantial risk of losing customers in large cities if they are not given the go-ahead to price services competitively.

"Tariff 12 and Tariff 15 get the headlines, but Nynex and PacBell are cutting the deals," Levine said.

Leading ANI backer examines pros, cons

AT&T ISDN pioneer discusses ANI development, ponders future on implementation, legal issues.

ISDN's automatic number identification (ANI) capability can help customers process more telephone calls, boost worker productivity and improve customer service. But improper implementation of ANI can spook customers by dredging up Orwellian images of Big Brother ("Companies mask ANI to calm callers," *NW,* Feb. 20).

With ANI, the caller's telephone number arrives with the call, enabling telemarketing organizations to match the number with a customer data file and simultaneously deliver the call and a customer profile to an agent's terminal.

Gerry Canavan, ISDN product manager/early customer implementations for AT&T, helped launch and manage the company's first two Integrated Services Digital Network Primary Rate Interface trials in the U.S. Both users — American Transtech and American Express Travel Related Services Co. (TRS) — now use ANI in live applications.

Canavan discussed the evolution of ANI, how best to implement the technology and legal issues surrounding it in a recent interview with *Network World* Senior Editor Bob Wallace.

How many corporations and organizations currently use ANI, and how many will be using it by year end?

Five companies use ANI now. Those applications are fairly limited in nature.

We have 161 [ISDN Primary Rate Interface] customers lined up; the majority are interested in ANI applications.

How was ANI first intended to be used?

We saw the biggest use of ANI in telemarketing and customer service applications.

We foresaw ANI being used to pull up records about a customer and deliver them with the customer's call to a telemarketing agent.

In your work with prospective ANI users, do you suggest how ANI may best be used?

Absolutely. We worked closely with [TRS] and let them draw on the expertise we gained from our American Transtech [ISDN Primary Rate Interface] trial.

A prospective ANI user must look at a few items when considering an application.

(continued on page 17)

WASHINGTON UPDATE

BY ANITA TAFF

Call for stricter AOS control. U.S. Rep. Jim Cooper (D-Tenn.) last week sent a letter to fellow House members urging them to support legislation he introduced earlier this month requiring stricter control of alternative operator service (AOS) providers.

The legislation is necessary, according to Cooper, to protect consumers from the deceptive business practices of some AOS companies. Pay-phone owners contract with AOS companies for operator services in exchange for a commission, which is typically 15% of the charge, Cooper said. Although AOS arrangements are popular among institutions such as hospitals and universities because they are an easy source of revenue, consumers often end up the big losers, Cooper said.

Callers are not always told that their call will be handled by an AOS provider, and some of these operator services charge rates 50% to 100% higher than AT&T, he said.

The Federal Communications Commission has received 2,000 complaints about AOS providers and has opened a proceeding on the issue, but the agency has been slow to act, Cooper said.

Cooper's legislation would require the FCC to adopt four rules: A written notice that an AOS company will be handling the call must be posted near the phone; AOS companies would be required to answer callers' questions about rates and would have to set up a complaint procedure; AOS companies would be prohibited from blocking access to any long-distance carrier; and the companies would be required to charge just and reasonable rates.

How UDS squeezes more out of the V.32 standard

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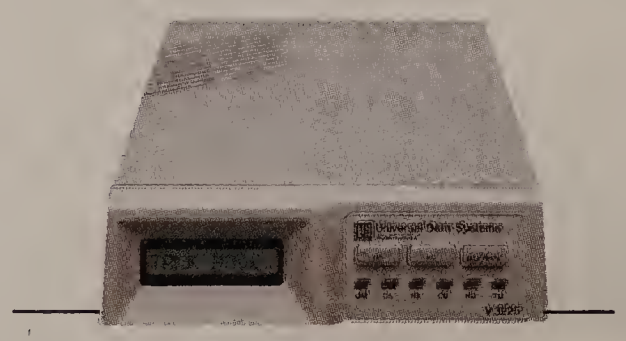

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Worth Noting

"IBM has done a good job with NetView/PC. The problem [is that the way third-party vendors] implement their NetView interface is not always the best. Unless each side understands the other's environment, there are going to be problems."

Doug Weber
District manager
and NetView user
Southwestern Bell
Telephone Co.
St. Louis

Data Packets

BBN Communications Corp. recently unveiled a software package that lets users monitor remote X.25 packet-switching node host ports on a BBN Communications private packet network.

The software, called NetScope, is designed to debug protocol problems that appear when new types of X.25 hosts are attached to a network or when initially installing and testing a packet network. With the software, work that once had to be done through visits to the trouble spot can now be done remotely.

The software runs on an IBM Personal System/2 that is linked via X.25 to a node anywhere on the packet network. By displaying protocol headers in a simplified format, NetScope interprets X.25 Level 2 and Level 3, Qualified Logical Link Control (a Systems Network Architecture protocol), Transmission Control Protocol and User Datagram Protocol.

The software is priced at $20,000 and will be available in the second quarter of 1989.

BBN Communications is located at 150 Cambridge Park Drive, Cambridge, Mass. 02140, or call (617) 873-2683.

CA adds networked relational data base

Firm's new offerings enable users to distribute data base across mainframes linked over a net.

By Paul Desmond
Staff Writer

NEW YORK — Computer Associates International, Inc. (CA) recently announced a new version of its relational data base management system that can be partitioned among networked mainframes to increase performance.

The product, CA-Datacom/Star Release 2.1, was announced at a briefing here along with an array of other new or enhanced products. Computer Associates also offered a statement of direction in the wake of its acquisition of rival Applied Data Research, Inc. (ADR) last October.

The other new products included a personal computer version of Datacom/Star and a data base server for local networks. Those products promise to increase network performance and data integrity by allowing personal computers to share processing power, said Dominique Laborde, vice-president of research and development for data base at Computer Associates.

CA-Datacom/Star is the distributed data base component of CA-Datacom/DB, the DBMS that Computer Associates acquired when it bought ADR from Ameritech. Datacom/Star 2.1 is actually a new version of InfoReach, ADR's distributed data base component of Datacom/DB. Datacom/Star allows networked IBM mainframes running MVS, VSE or VM to share data bases and have the appearance of a single data base to end users, Laborde said.

That alone puts the company ahead of IBM in the distributed data base arena because IBM's DB2 distributed DBMS product supports only MVS and VM, said Jeffrey Tash, president of Database Decisions, a consulting company in Newton, Mass.

As part of its statement of direction, Computer Associates announced that the distributed DBMS will also be supported under the PC-DOS, OS/2 and Unix operating systems and on Digital Equipment Corp. VAX processors. Each of these options will put the company even further ahead of IBM, Tash said.

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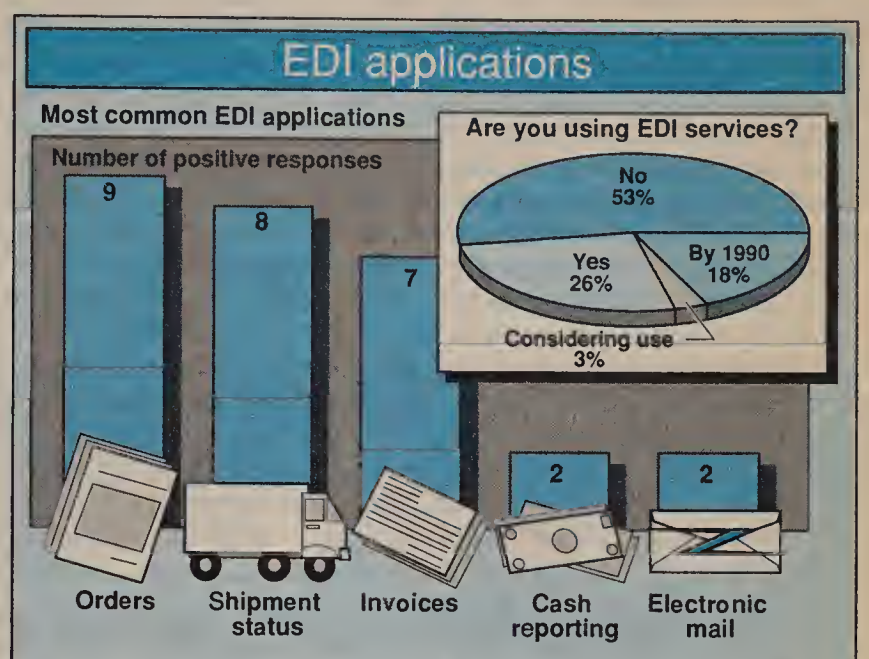

Figures are based on a survey of 36 large process control companies. Five companies said they use EDI services developed in-house. Of the third-party EDI providers, GE Information Services' EDI*Express is used by four companies, Telenet Communications Corp.'s Ordernet by three and the IBM Information Network's EDI Service by two.

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: NEWTON-EVANS RESEARCH CO., INC., ELLICOTT CITY, MD.

Plexus offers entry-level, 386-based imaging system

SAN JOSE, Calif. — Plexus Computers, Inc. recently announced an entry-level version of its networked image processing system.

Plexus is marketing the latest addition to its Extended Data Processing (XDP) System family to users with separate small work groups as an entry-level standalone imaging system or as an application development tool for large users and OEMs, said David Wood, marketing manager for the vendor.

The XDP System comes with Plexus' new P/386 DataServer, four IBM Personal Computer AT clones, a high-speed image scanner, an eight-page-per-minute laser printer, and all data server and workstation software.

The imaging system serves as a storage subsystem for complex graphics and images scanned into the system's data base. Any workstation on the network that uses Plexus' imaging softare can access the image data on the server.

At the heart of the system is the P/386 DataServer, which is based on the Intel Corp. 80386 processor running on a Personal Computer/AT bus. The P/386 DataServer runs under Unix Version 5.3 and comes with 300M bytes of storage and 4M bytes of memory, as well as an Informix Software, Inc. relational data base management system. The server can be expanded to 900M bytes of storage by using three magnetic disk drives, or it can be expanded to 600M bytes with one magnetic drive and one optical drive.

Plexus' DataManager software extends the capability of the Informix Software data base by giving it the ability to handle a variety of data types, including images, text, voice and colors, Wood said.

The DataServer communicates with workstations and peripherals across an IEEE 802.3 Ethernet local network that supports Transmission Control Protocol/Internet Protocol. Designed to support from one to eight users simultaneously, the

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Drugstores check coverage with new on-line package

Stratus software speeds insurance payments.

By Paul Desmond
Staff Writer

DALLAS — Shared Financial Systems, Inc. and Stratus Computer, Inc. last week announced jointly developed application software for retail drugstore chains that supports on-line insurance verification and speeds insurance reimbursements.

HealthNet/2, when implemented on a central processor that supports pharmacy-based terminals, will enable stores to verify customers' insurance and their coverage, thereby reducing unacceptable insurance claims.

Stratus Computer and Shared Financial Systems will initially market HealthNet/2 to retail drugstore chains, which must comply with a federal government mandate to support on-line verification of Medicare claims by 1991, said Richard Jacobson, industry marketing manager of retail and distribution for Stratus Computer. The companies are also assessing the product's application for health maintenance organizations (HMO), hospitals and other health care providers.

HealthNet/2 runs on Stratus Computer's XA 2000 Continuous Processing minicomputers under a proprietary operating system. The XA 2000 is a fault-tolerant machine designed for transaction processing, Jacobson said. It is resold by both IBM, as the System/88, and by Ing. C. Olivetti & Co., S.p.A. as the CPS system.

Pharmacists can use a range of existing terminals to dial into a central Stratus Computer processor. The XA 2000 supports asynchronous, X.25, IBM Binary Synchronous Communications, Synchronous Data Link Control, 3270 and other terminal protocols.

Besides validating insurance coverage, HealthNet/2 provides on-line claims approval, a process called adjudication through which third parties such as Blue Cross and Blue Shield and Medicare agree to the amount they will pay for prescriptions.

Negotiating claims electronically, as opposed to mailing insurance forms, slashes reimbursement time from the usual six to eight weeks to as little as two weeks, according to Joe Phillips, senior vice-president of Rite Aid Corp. Rite Aid, the nation's fourth-largest retail drugstore chain, is an early HealthNet/2 user.

"On-line eligibility verification is important for a simple reason," Phillips said. "It cuts the number of rejected claims. When you cut the number of rejects, you cut direct financial losses."

HealthNet/2 can be used in conjunction with Shared Financial Systems' previously released ON/2 software, which gives retailers access to credit card providers and other financial services. Using both packages, pharmacists can also gain payment authorization for credit card purchases, said Bob Heard, vice-president of marketing for Shared Financial Systems.

Rite Aid is the second of the country's top four retail drug chains to license HealthNet/2, Shared Financial Systems said. The vendor declined to release the name of the other chain.

Drugstore chain operators can

(continued on page 20)

Drugstores check coverage with pack

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also use the software to decrease their reliance on third-party verification firms, such as Phoenix-based Pharmaceutical Card Systems, Inc. (PCS), which acts as a clearinghouse for insurance companies and corporate health plans. Such firms charge a fee for each transaction, Heard said.

HealthNet/2 users can cut the number of transactions forwarded to such third parties by collecting information directly from insurance companies via magnetic tape and storing it on a central Stratus Computer processor, Heard said.

One problem with that strategy, however, is trying to keep the internal data base updated, said Bill Lockwood, president and publisher at ComputerTalk Associates, Inc., publisher of the bimonthly magazine *ComputerTalk for the Pharmacist.*

"How often is Rite Aid getting a tape from Blue Cross, for example?" Lockwood asked. "Are they getting it every day? They're probably getting it every month." That could be a problem since insurance companies and other health plan carriers add and drop clients each day, he said.

To verify a claim, the pharmacist uses a magnetic strip reader or manually keys in customer information on a terminal. After the customer identification information is entered, the software dials into the remote Stratus Computer processor while the pharmacist continues to enter information regarding the prescription, such as price and quantity.

After the information is entered into the processor, the claim is either processed using information stored in the data base or routed to the appropriate third party, Heard said.

The software translates information from pharmacy terminals into a proprietary format for processing on the Stratus Computer XA 2000 and then converts it to the necessary formats used by the drugstore chain's third-party partners, he said.

Once it has been determined that a customer is eligible for benefits, the pharmacist receives a message detailing the amount the insurer will pay as well as any residual cost to the customer.

Pricing for HealthNet/2 hardware and software ranges from $400,000 to $600,000, depending on configuration. The product is being marketed through Shared Financial Systems.

Plexus offers imaging system

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DataServer can connect as many as 32 workstations.

To upgrade from the XDP System to a larger network, the P/386 can be converted into a workstation when users buy a larger P/90 or P/95 server, Wood said. All other equipment, except the magnetic disks used with the P/386, is compatible with the larger servers, he said.

The basic configuration of the entry-level XDP System, including the P/386 DataServer, four workstations, scanner, laser printer and software, costs $97,840.

An optional 5¼-in. Write Once Read Many (WORM) optical disk drive with 600M bytes of storage per disk costs $11,450.

For more information, contact Plexus at 3833 N. First St., San Jose, Calif. 95134, or call (408) 943-9433.

3Com exec urges users to insist on OSI products

By John Cox
Senior Editor

WASHINGTON, D.C. — Users lamenting the scarcity of products that support the Open Systems Interconnection model should stop complaining and demand products.

This advice was offered recently by Robert Metcalfe, general manager of the Distributed Systems Division at 3Com Corp., the Santa Clara, Calif., local net supplier. Metcalfe, who is also president of the Corporation for Open Systems, an industry group promoting OSI, spoke at the Communication Networks Conference and Exposition '89 about OSI development.

The goal of open systems networking is to let different vendors' products and applications interoperate through mutual support of standard communications protocols. OSI defines a model that forms the basis for these protocols, which vendors use to design their products.

OSI products, however, are still just trickling into the market, later and more slowly than OSI advocates expected a few years ago, Metcalfe said. But users can prod vendors to create more OSI products and create them more quickly.

"Users can insist [on OSI products]," he said. Specifically, they can push their case by including OSI compliance as part of their requests for proposal. Hughes Aircraft Co. has notified its vendors that in the third quarter of 1989 they will have to provide OSI-compliant products to satisfy Hughes' RFPs, Metcalfe said.

Metcalfe also cited the efforts of the Aerospace Industries Association (AIA) to require vendors of electronic mail networks to link the nets together. The interconnection will let AIA's 49 members, which often work together on large aerospace contracts, to exchange project information more easily than they can now, according to an AIA spokeswoman.

Moreover, the U.S. government announced last year that its Government OSI Profile (GOSIP) would become effective in 1990. "They're saying, 'If you want to sell to the U.S. government, you better have GOSIP products,' " Metcalfe said.

CA adds data base

continued from page 19

A key component of Datacom/Star is its support for a two-phase commit protocol, according to Dick Hatch, senior consultant to the data processing environment at the U.S. Customs Service, an early user of the product. The protocol provides for data integrity by confirming that an update is entered on all concerned pieces of a partitioned data base, Hatch explained.

Under the two-phase protocol, when a command is issued to update the data base, the processing data base informs all other participants of the intent to update, said Jayce Fortwangler, another senior consultant on the project. If all participants respond that they are ready to accept, the update is entered.

If communications is disrupted while an update is in progress, data is backed out to the last point at which updates were confirmed by all participating data bases.

The data base staff at the Customs Service, under Director of Computer Operations Gary Cantrell, has been working with Computer Associates during the past two years to develop what is now the Datacom/Star product.

The Customs application

The Customs Service has a National Advanced Systems, Inc. AS/XL-100 mainframe and two IBM 3090 mainframes in two buildings in the Washington, D.C. area.

The mainframes support more than 10,000 devices and process two million CICS transactions per day, Cantrell said. That translates to somewhere between 100 million and 200 million data base requests each day, he said.

The agency keeps track of the import and export of goods, the collection of duties and tariffs, and the brokers and shippers that move the goods. Customs has been using Datacom/Star in a development environment to test its capabilities.

The software allows customs to partition its data bases in various ways, for instance, in accordance with time zones. That strategy increases performance because users' terminals can be linked to the portion of the data base they use most often.

"With the partitioning aspects of [Datacom/] Star, I have been able to increase throughput capability 100% to 200%," Hatch said.

The software also increases network availability by allowing better scheduling of periodic maintenance. For example, after regular East Coast business hours, customs can perform maintenance on the portion of the data base used by the East Coast without interrupting West Coast users.

CA-Datacom-Star/PC is the personal computer version of Datacom/Star that provides distributed DBMS services between mainframes and IBM Personal Computers running PC-DOS or OS/2, according to Computer Associates' Laborde.

With the product, a portion of a data base can be stored on a personal computer, decreasing mainframe calls by taking advantage of the microcomputer's power, he said.

That improves the two most common forms of personal computer and mainframe processing, Laborde said. The first, periodically downloading data from a mainframe for local processing, means data is never completely current. And the second, using the personal computer to emulate a terminal, wastes the computer's processing power.

A third product included in the recent announcement is CA-Datacom/Server, which turns a personal computer on a token-ring local network into a data base server for the others, Laborde said. "It allows you to have your data base on one of your PCs and have all the other PCs take advantage of that information instead of duplicating the files in each PC," he said.

By installing Datacom/Server on multiple personal computers in a network, users can approach the processing power of a minicomputer, he said.

CA-Datacom/Star Release 2.1 is scheduled for beta testing during the third quarter of this year and will cost between $43,000 and $61,000, depending on configuration.

CA-Datacom-Star/PC and CA-Datacom/Server are both scheduled for beta testing in the second quarter of 1990. Neither product has been priced. Release dates have not been announced for any of the products.

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Worth Noting

"Novell has sold over 200 copies of NetWare for VMS since it began shipping four months ago. Large users like Chrysler Corp., Kellogg [Co.] and Irving Trust Co. are using it in networks of over 20 nodes."

Mark Calkins
Vice-president of marketing
Novell, Inc.
Software Group

Netnotes

Vendor interest in **Sybase, Inc.'s** SQL Server continues to grow. In the past month, **IBM** and **AT&T** have joined the software company's growing list of development partners that want to integrate the product into their net wares.

Under the terms of these two latest agreements, Sybase, based in Berkeley, Calif., will be porting the SQL Server to two additional Unix platforms: AIX for IBM RT Personal Computer workstations and Unix System V 3.2 for AT&T's 3B2 minicomputers and 6386 Work Group System workstations based on Intel Corp.'s 80386.

SQL Server acts as a back-end data base processor running on servers for front-end applications running on client workstations. The OS/2 version, being codeveloped with Microsoft Corp. and Ashton-Tate Corp., is scheduled to ship in April. SQL Server is "scalable" because it runs on a range of hardware platforms. A front-end application works with all the SQL versions, enabling users to upgrade to a more powerful SQL Server back-end device as needed.

At the UniForum Unix show in San Francisco this week, **Epoch Systems, Inc.** of Marlborough, Mass., is expected to demonstrate a virtual-disk file service for workstations using **Sun Microsystems, Inc.'s** Network File

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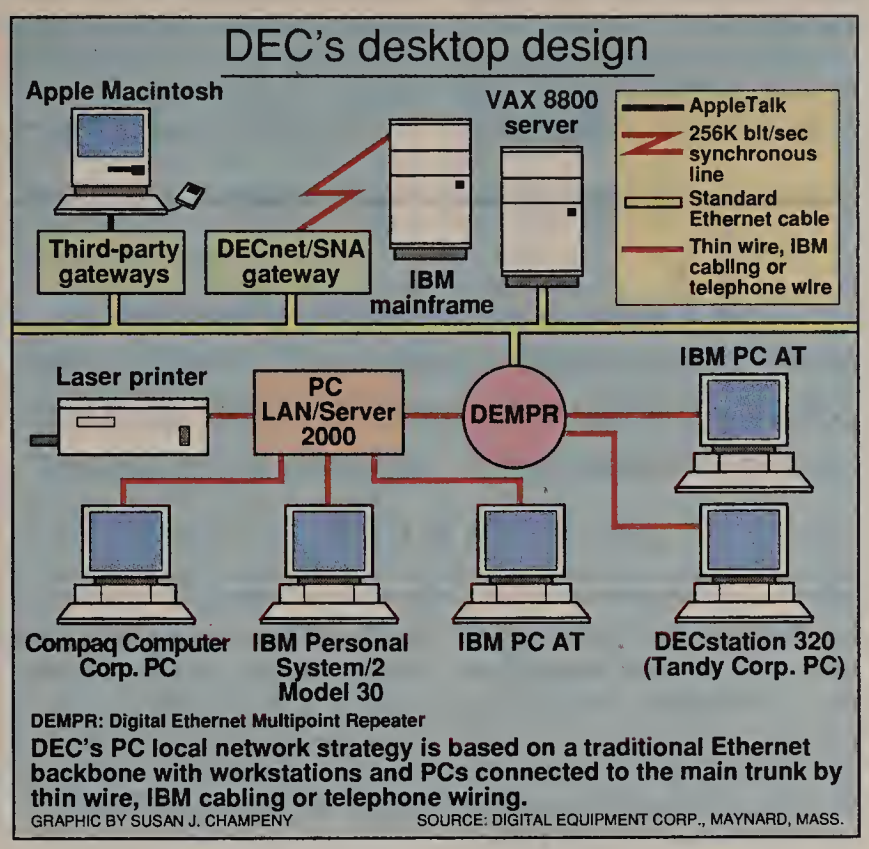

DEC hits on flexible PC local net strategy

Latest connectivity scheme offers cohesiveness without locking users into an all-DEC net solution.

By Laura DiDio
Senior Editor

LITTLETON, Mass. — After two failed attempts to address personal computer network needs, Digital Equipment Corp. has developed what many industry analysts say is a cohesive connectivity plan for desktop devices.

DEC said it wants to provide the method to integrate several different desktop hardware platforms and operating system environments while at the same time positioning DECnet as the means to link workstations to high-end VAX servers.

NAS linchpin

The linchpin of DEC's strategy is its Network Application Support (NAS) architecture, which was announced in January 1988.

NAS is a software architecture that combines the functionality of the company's DECnet network architecture with several components designed to integrate multiple desktop devices, including DEC VT-style terminals, DEC VMS-based workstations, DOS- and OS/2-based personal computers, Apple Computer, Inc. Macintoshes, DEC Unix workstations and X/Windows-based terminals running multiple operating systems.

Five months ago, DEC buttressed NAS with the introduction of a line of desktop personal computers, workstations and servers.

"DEC has all the right technology in place to come up a winner in the PC LAN industry," said George Colony, president of Forrester Research, Inc. in Cambridge, Mass.

Until last year, DEC's low-end local network strategy was of secondary importance to the game plan for its networks of minicomputers and workstations, which yielded higher profit margins than personal computer nets, analysts said.

However, with personal computer local network revenues growing 50% to 60% a year, no vendor can afford to ignore this market, said Gail Daniels, DEC's local network market manager.

Consultants agree. "It would be a strategic disaster for DEC not to participate in the PC LAN market. They'd cut themselves off from a whole generation of buyers and users," said Steve Wendler, an analyst at Gartner Group, Inc. in Stamford, Conn.

> "DEC has all the right technology in place to come up a winner in the PC LAN industry," said Forrester Research's Colony.
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DEC's first desktop personal computer strategy, initiated in 1983, was a dismal failure, according to Terry Shannon, man-

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Pyramid offers host-class processor based on Unix

Firm's MIServer uses client/server architecture.

By Susan Breidenbach
West Coast Bureau Chief

MOUNTAIN VIEW, Calif. — Pyramid Technology Corp. recently rolled out Corporate MIServer, a powerful Unix-based mainframe-class processor that is designed to serve networks of workstations and personal computers.

MIServer, with the power to process 140 million intructions per second (MIPS), uses X.25, Sun Microsystems, Inc.'s Network File System, Transmission Control Protocol/Internet Protocol and other industry-standard communications protocols to communicate with attached devices.

Pyramid Technology, like a number of minicomputer manufacturers, has embraced the client/server architecture, positioning its Reduced Instruction Set Computing (RISC)-based minicomputers as back-end servers capable of supporting networks of client workstations.

"Until now, client/server environments have been confined to small work groups and departmental superminicomputers, [and they have been] limited by underpowered platforms with inadequate connectivity," said Richard Lussier, Pyramid Technology's chairman and chief executive officer.

MIServer, in its maximum configuration, can support more than 1,000 concurrent users and has slots to connect up to 16 Ethernet local networks.

MIServer is available in models with four to 12 RISC processors. It uses Pyramid Technology's "symmetric multiprocessing" architecture.

There are also three separate system buses: one for CPUs, one for accessing system memory and one dedicated to I/O channels.

In its maximum configuration, the MIServer provides what the company describes as 140 "VAX 11/780 equivalent" MIPS. This represents a quantum leap in performance over its 25-MIPS Model 9845, which is the top of its existing Series 9000 line.

The price for the horsepower ranges from $700,000 to $1.8

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Apollo wins FDDI net deal from Defense Department

By Laura DiDio
Senior Editor

CHELMSFORD, Mass. — Apollo Computer, Inc. last week said the Department of Defense has awarded it the first government contract to build a network based on the 100M bit/sec Fiber Distributed Data Interface (FDDI) standard.

Although Apollo officials would not say which Department of Defense branch would use the network, the company did say it will consist of three Apollo Series 10000 Personal Supercomputer nodes and will be operational by September.

According to Keith LeFebvre, Apollo's group marketing manager for data communications products, more Series 10000s will be added to the backbone in the future.

The FDDI components Apollo is using under the contract will not be available commercially until various software standards issues are resolved later this year or in early 1990, LeFebvre said.

One of the Series 10000s in the FDDI net will act as a gateway between an Ethernet and an Apollo token-ring net, the company said. The Series 10000 workstations pack 100 million instructions per second of processing power and are based on Apollo's Reduced Instruction Set Computing architecture.

Besides the Series 10000 workstations, Apollo will supply the government with FDDI network adapter boards and Station Management Software (SMT). SMT is the network management software partially specified in the IEEE 802.5 FDDI standard.

Apollo said primary applications of the net include real-time transmission of files, electronic mail and image processing.

Apollo's Department of Defense contract is unusual because the company did not have to bid against other suppliers. Instead, government officials approached Apollo last July to build the FDDI network, LeFebvre said.

Apollo declined to specify the exact amount of the contract; however, some components in the deal could be worth as much as $500,000.

LeFebvre said the per-node FDDI connection cost would be between $15,000 and $20,000.

DEC hits on flexible LAN strategy

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ager of the DEC advisory service at International Data Corp. in Framingham, Mass.

"They introduced three internally incompatible hardware platforms: the VAXmate, the DECmate II and the Rainbow," which were not compatible with IBM equipment, Shannon said. "They didn't solve users' problems; they just created confusion."

DEC tried the desktop market again in 1986, this time with an Intel Corp. 80286-based VAXmate personal computer. "It was late to market; and at $7,000, it was priced three times higher than comparable PCs," Shannon noted.

Key to NAS are several programs that enable DECnet net-

DEC's Gail Daniels

works to support disparate hardware and operating systems.

VAX/VMS Services for MS-DOS, for instance, allows VAX and MicroVAX computers to be positioned as local network servers for applications, file storage, print queuing and data base manipulation. VAX/VMS Services for MS-DOS is now included in every DECnet VAX license.

DEC also currently provides VMS/Ultrix Connection, which offers many of the same features of VAX/VMS Services for DOS but provides those capabilities for systems operating under Ultrix, DEC's version of Unix.

Mac and OS/2

DEC has promised future software releases designed to provide similar services for Macintosh- and OS/2-based systems. "We'll have a software application by August that will enable DECnet users to connect to AppleTalk networks," Daniels said. "We'll provide OS/2 connectivity when the market develops."

While DEC has made some strides to merge personal computers into DECnet, its job is far from over.

DEC currently supports DOS-based workstations with DECnet. However, the company has not yet provided a way for DECnet to support de facto local network operating systems such as 3Com Corp.'s 3+Open and Novell, Inc.'s NetWare. This has hampered users' ability to use DECnet to integrate these environments.

"DEC is going to have to support either Novell, 3Com or both," Forrester Research's Colony said. "But it's a very politically charged issue within DEC; they don't want to support either one — especially not NetWare."

NAS insights

NAS combines the functionality of DECnet with DECWindows. DECnet provides physical Ethernet connections, the network operating system and VAX/VMS Services for DOS. DECWindows provides a common user interface and the Compound Document Architecture (CDA).

DECWindows offers a common user interface across different devices, including personal computers, workstations and terminals. CDA enables users to manage documents composed of multiple elements, including text, graphics and images.

"NAS positions DEC to be a complete systems integrator," Shannon said. "Even if the company doesn't sell the desktop hardware, it can still integrate other vendors' hardware into the network regardless of the hardware architecture or operating system."

But the company fully intends to sell more iron. DEC rolled out a series of new desktop devices last October as a core component of its network strategy. The products include the DECstation 210, 316 and 320 line of MS-DOS-based personal computers, manufactured by Tandy Corp.; the DECstation 3100, a reduced instruction set computing Ultrix-based workstation; and the DECstation 3100 server, a server-based version of its Ultrix workstation.

DEC will also support several VAX-based offerings as part of its desktop network strategy, including the VAXstation 3100 workstation, a VAX-based workstation; the VAXstation 3520/3540 graphics workstations for the X/Windows environment; and the PCLAN/Server 2000, a MicroVAX 2000-based file and application server for personal computer nets.

> "DEC is going to have to support either Novell, 3Com or both," Colony said. "But it's a very politically charged issue within DEC; they don't want to support either one — especially not NetWare."
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The introduction of the PCLAN/Server 2000 also gave DEC its first personal computer network server product. The server supports as many as 16 personal computers.

"The PCLAN/Server gives us the ability to go after small users with eight- to 30-node local nets that might be running NetWare or 3+Open now," Daniels said.

Physical connections

Besides broadening its software and hardware lines, DEC is attempting to expand its physical connection options.

The company now supports DECnet on twisted-pair wire, an economical alternative to Ethernet coaxial cable. And after holding out for several years, DEC recently announced it will add support for IBM's Cabling System to its own DECconnect unified building wiring system.

"DEC had to connect to users in the IBM environment or find themselves out of a lot of business," said Joaquin Gonzalez, vice-president of consulting and business development at Aries Group-MPSG in Rockville, Md.

Making the grade

DEC today still finds itself with three incompatible desktop platforms, but the company has put in place the software and hardware to bring them all together. Analysts approve of the strategy.

"On a scale of one to 10, I'd give the NAS strategy a nine," said Gartner Group's Wendler. "It's the best software strategy in the industry because the applications that are built on the NAS facilities will provide the highest level of integrated functionality in the industry — much better than IBM, Novell, 3Com or Microsoft Corp.," he said. "And it's a big improvement over the prior two PC LAN strategies."

Pyramid offers processor

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billion, depending on the configuration. It is not a device for work groups seeking only a file server.

However, Pyramid Technology is hoping it will appeal to companies that want to move critical applications, such as an on-line transaction-processing data base, off of a proprietary mainframe and into an open client/server environment.

MIServer also offers a single platform to consolidate data bases scattered across multiple local net file servers.

According to the company, its existing Series 9000 and the new MIServer are object-code compatible, enabling Series 9000 users to move to a more powerful system while preserving their investment in application software, I/O controllers and peripherals.

This means that the company's entire product line can be viewed by potential customers as a single server of considerable range.

MIServer runs Pyramid Technology's OSx 5.0, which is a dual-port version of Unix that supports both AT&T's System V and Berkeley Unix standards.

OSx 5.0 also complies with the IEEE P1003.1 Portable Operating System Interface specification.

A unique enhancement to Unix in OSx 5.0 is the company's virtual disk subsystem.

This feature lets users create logical files that can span physical disks or keep files in system memory to improve the performance of disk-intensive data base applications.

MIServer is available now.

Start-up Castelle offers fax server for NetWare LANs

FaxPress is first in line of planned fax products.

By Susan Breidenbach
West Coast Bureau Chief

SANTA CLARA, Calif. — Start-up Castelle, Inc. recently introduced its first product, a facsimile server for Novell, Inc. NetWare local networks.

Called FaxPress, the server is a self-contained unit, approximately the size of a textbook, that attaches directly to Ethernets running NetWare Version 2.0a or higher.

The product enables NetWare users to exchange facsimile files with a central resource dedicated to facsimile transmissions rather than having to outfit each personal computer on the network with a facsimile adapter board.

According to Eli Schetrit, president and cofounder of Castelle, FaxPress is the foundation of a facsimile server line that will ultimately support a variety of local networks and offer an assortment of enhancements.

NetWare and Ethernet were selected for the first model because they represent the largest installed base of local network users, Schetrit said.

FaxPress contains two Motorola Corp. 68000 microprocessors that manage facsimile queuing, storage and formatting, and a 9.6K bit/sec modem for transmissions. It also packs 1.5M bytes of memory, which enables it to handle graphics and documents containing multiple print fonts and sizes.

The unit also contains an RS-232 serial port and a Centronics, Inc. parallel printer port, and it can double as a print server when attached to a printer.

A built-in RJ-11-C jack is used to connect FaxPress to a dedicated telephone line. The system can be programmed to automatically print out all incoming facsimile documents on an attached Hewlett-Packard Co. LaserJet or compatible printer.

the printer from getting tied up with an unwanted "junk mail" file.

Outgoing facsimile transmissions can be sent from within applications, so users do not need to exit an application to transmit files. Once a user sends the document to FaxPress, the server takes over distribution of the item, freeing the user's personal computer for other tasks.

Facsimile documents do not have to be ASCII files, as required by other facsimile devices. According to Castelle, the ability to transmit such documents from within local net applications "is a technology breakthrough unique to FaxPress."

While many facsimile machines scan outgoing and print incoming documents at a resolution of 200 dots per inch, the Castelle device supports HP LaserJet's 300-dot-per-inch resolution. Documents that can be printed on a LaserJet or compatible can be transmitted by the FaxPress at the higher resolution.

FaxPress is compatible with CCITT Group III facsimile devices and has features associated with high-end facsimile devices, such as automatic redialing.

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FaxPress is compatible with CCITT Group III facsimile devices and has features associated with high-end facsimile devices. These include automatic redialing, a facility for broadcasting documents to multiple recipients and a timer feature to delay facsimile transmission to take advantage of after-hours phone rates.

Facsimile transmissions received by the dedicated server do not have to be immediately printed; they can be previewed on a recipient's screen. This can prevent

The product will be available in April at a cost of $3,650.

Castelle was established in October 1987 to develop dedicated communications servers that optimize work group computing.

Bank scraps terminal net, selects OS/2 LAN Manager

By David Beynon
International News Service

MELBOURNE, AUSTRALIA — ANZ Banking Group has embarked on a multimillion-dollar overhaul of its network, gutting an existing terminal net for an IBM Token-Ring Network running Microsoft Corp.'s OS/2 and OS/2 LAN Manager.

The bank, one of Australia's largest financial institutions, spent $8.76 million to buy 750 OS/2-based personal computers and workstations from Finnish manufacturer Nokia Data Systems.

The bank's purchase of the Nokia personal computers, workstations and software is the first stage of a branch office system upgrade to replace 10,000 Unisys Corp. EF315 terminals. The upgrade is expected to take several years.

The Nokia Banking System (NBS) is a composite system consisting of Intel Corp. 80286 and 80386 workstations, communications servers and gateways, document printers, self-service terminals and a data base. The system is connected via OS/2 LAN Manager and the Nokia Banking Frame (NBF), a proprietary software protocol running under OS/2 and OS/2 LAN Manager.

NBF is an environment designed to support on-line transactions with multiple processors as well as local applications under OS/2, according to Jeff Pitt, general manager for retail financial services for ANZ. The system offers encryption and management of transactions by serial numbers.

NBS gives the bank greater ability to distribute new application software, allowing quicker and more flexible market responses, he said.

Pitt said an evaluation of Nokia's system showed it would meet the bank's goal to support OS/2.

Setting priorities

"It's clear that ANZ has taken a different direction from our competitors, who are busy upgrading their host systems. Our priority is to get our customer services terminals right," Pitt said.

The Nokia systems will be used for all back-office functions such as opening accounts, credit card applications and loan detail processing, Pitt said. The system may be extended to the front office for use by tellers and customer service officers by the end of this year.

Distribution of new applications to the 10,000 terminals throughout the old network requires that changes be made to the bank's IBM 4710 network controller.

However, NBS provides a common development environment and enables the bank's network managers to directly download new applications, bypassing the network controller constraint, according to Pitt.

Netnotes

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System (NFS) hard disks, providing a cache memory for the most frequently accessed on-line files.

The server, which can be accessed by any NFS device on the local network, offers up to 150G bytes of on-line storage. It includes up to 20M bytes of memory for file caching and as much as 7.7G bytes of Winchester disk storage. The magnetic drives are augmented by optical jukebox storage subsystems that can provide more than 100G bytes of additional — and less expensive — storage. The optical disks are transparent to the user, appearing as virtual Winchester disks.

Graphic Software Systems, Inc. of Beaverton, Ore., has released a product that enables users of DOS-based personal computers to access X/Windows-based Unix systems running over an Ethernet local network. The software, called PC-Xview, turns the personal computer into a low-cost X/Windows workstation. Users can hotkey between Unix and DOS applications. PC-Xview costs $295.

Ethernet Over Twisted Pair.

WITHOUT THE ABILITY TO EASILY MONITOR AND CONTROL NETWORK EVENTS...

Without comprehensive network management *and* control capabilities you're not taking full advantage of the benefits of running Ethernet over twisted pair. And you could even be risking your company's vital information resources.

Only Cabletrons' solution provides an integrated three-tiered management and control scheme called LANVIEW™. It allows you to easily monitor network events from a single remote workstation to identify bottlenecks and marginal communications links. But unlike other so-called management systems, LANVIEW™ not only alerts you to potential problems, but also gives you the control functions you need to take corrective action quickly.

LANVIEW™ allows you to enable or disable individual ports and reroute network traffic around the problem *before* it affects performance. It also provides automatic redundancy and complete physical layer diagnostics to assure network reliability.

So if you're considering a twisted pair solution, make sure you protect your investment. Check out Cabletron's Multi Media Access center with LANVIEW™ and see how easy *and affordable* it can be to manage Ethernet networks over a variety of media including unshielded twisted pair cabling, IBM data cabling, coaxial cabling and fiber optic cabling.

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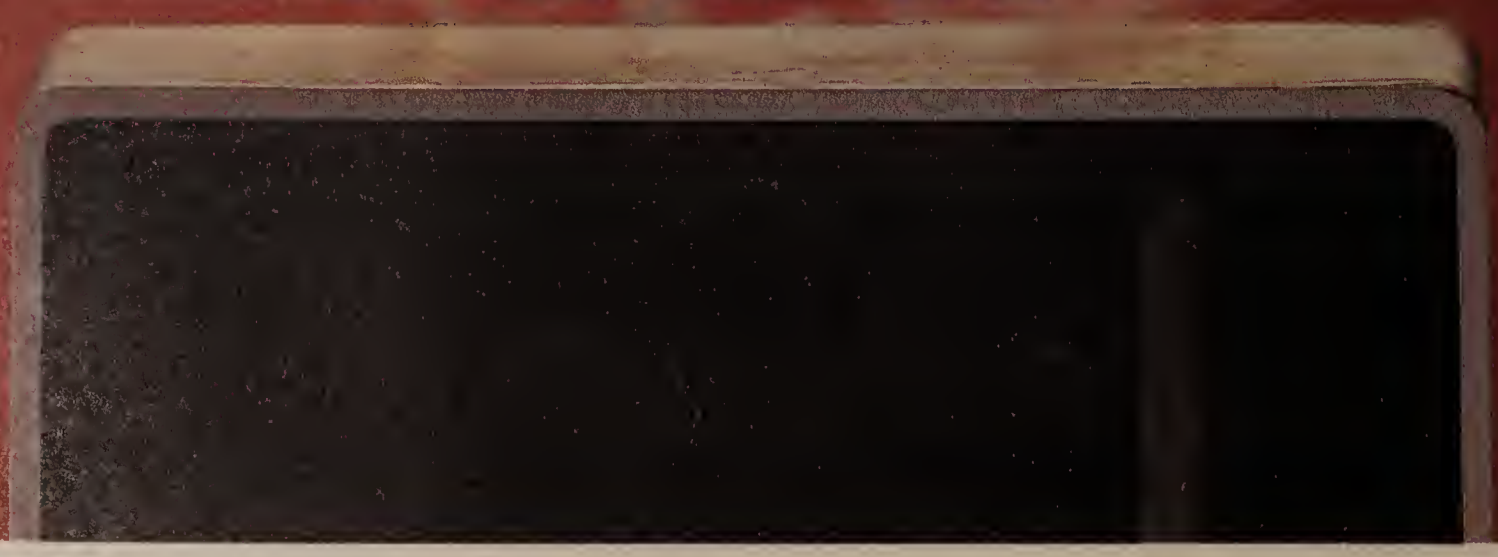
THE RESULTS COULD BE TERMINAL.



CORPORATE HEADQUARTERS:
CABLETRON SYSTEMS, INC.
[illegible]

Worth Noting

"In the 1990s, we will see substantial improvements in speed and throughput. As an inevitable consequence, business losses from severe [network] outages will grow more rapidly than any of us would think as more and more critical data moves over these systems."

Dixon Doll
Chairman and CEO
DMW Group, Inc.
Stamford, Conn.

Association Watch

The **Federation of Government Information Processing Councils,** a coalition of 21 users groups representing more than 14,000 federal, state and local government information systems professionals, will hold its annual conference, "People in Automation," March 29 to 31 in Kansas City, Mo.

Slated are seminars on the Federal Telecommunications System 2000 contract, implementing Government Open Systems Interconnection Profile standards and "gaining a strategic advantage through technology in government." Among the scheduled speakers are Glenn Haney, director of Information Resources Management for the U.S. Department of Agriculture, Lt. Gen. Emmett Paige, retired director of information resources management for the U.S. Army, and John Donovan, associate professor at Massachusetts Institute of Technology's Sloan School of Management.

Attendance at the event costs $350. For more information, write to the U.S. Department of Agriculture, National Computer Center at Kansas City, Computer Management Branch, Attn: Bill Johnson, 8930 Ward Pkwy., Kansas City, Mo. 64114.

Big firms should aspire to small company flexibility

Info technology can keep firms attuned to mart.

By Wayne Eckerson
Staff Writer

CAMBRIDGE, Mass. — Large corporations need to capture the flexibility, responsiveness and integrated structure of small companies to compete effectively in the highly competitive global economy.

That was the message of Robert Morrison, a speaker at a recent symposium entitled, "After Competitive Systems, What Comes Next?" sponsored by Index Corp., a management consulting firm headquartered here. Morrison, a principal with Index, said most companies are mired in outmoded corporate structures and production patterns that stifle interdepartmental communication and coordination.

But, he said, intelligent use of information technologies can dissolve barriers between departments and enable companies to react quickly to changes and opportunities in the marketplace.

"Large companies need to be more nimble and more integrated," Morrison said. "Companies that will succeed in the future are working now to reinvent their business practices and processes using information technologies."

Morrison said many companies use information technologies only to automate old processes. This merely reinforces organizational inefficiencies and prevents companies from gaining the flexibility and responsiveness they need to outpace rivals.

Companies today have to employ information technologies, particularly networks, to reshape their organizations to meet the needs of customers. While often painful, this reconstruction can yield significant cost savings and produce new services that translate into a strategic advantage, he said.

Morrison cited examples of companies that have used information systems in this way.

Using information technology, Hewlett-Packard Co. coordinated the activities of 50 purchasing departments in geographically dispersed divisions. This gave HP greater leverage in dealing with suppliers and let the company take advantage of volume discounts for larger orders.

Also, Morrison said, Xerox Corp. has used information systems to halve its product development time. The company has fos-

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BOOK REVIEW

A guide to taking the risk out of purchasing

Minimum Risk Strategy for Acquiring Communications Equipment and Service, Nathan Muller (Norwood, Mass.: Artech House, 1989), $66.

Purchasing net equipment is risky business these days. As networks play a larger role in corporate strategy and consume a greater portion of companies' hard-earned revenues, communications managers are entrusted with greater responsibility. The success of a communications manager hinges on his choice of vendors and the equipment, services and support those vendors provide.

Deregulation has spawned an unending number of aggressive start-up companies, making it difficult to determine whether vendors are financially stable companies that will provide necessary support.

In addition, the rapid pace of technological change and the proliferation of network products make it difficult for a communications manager to choose what is appropriate for a company's needs. The risk of choosing an unreliable vendor and obsolete or inappropriate products has never been higher: A company can lose its competitive position, and a communications manager can lose his job.

Despite the risks, few communications managers have the resources, time or skills to evaluate vendors and their products.

To help make this job easier, Nathan Muller, director of General DataComm, Inc.'s Consultant Relations Program, has

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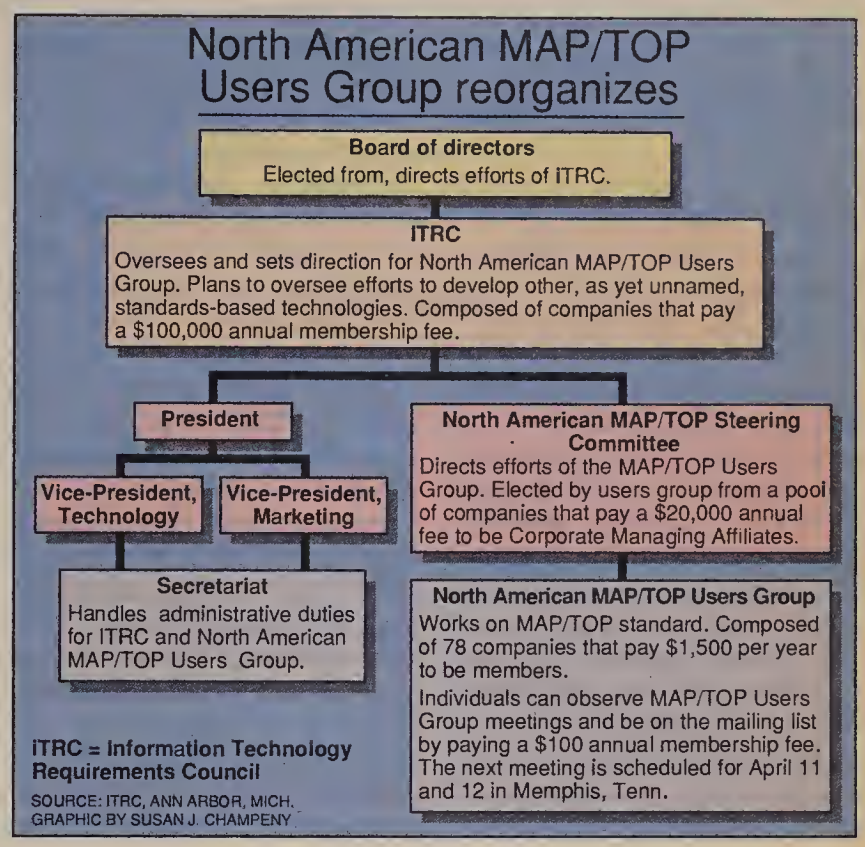

ITRC sets its sights beyond MAP/TOP

Information Technology Requirements Council to promote use, development of open systems.

By Barton Crockett
Senior Editor

ANN ARBOR, Mich. — The newly formed Information Technology Requirements Council (ITRC) is gearing up to battle Japanese and European groups in promoting open systems.

The group, based here, was formed six months ago to take over leadership of the North American MAP/TOP Users Group from General Motors Corp. and The Boeing Co. ITRC currently has 11 corporate members and an annual budget of $2.5 million.

According to ITRC members, the group now wants to move beyond the Manufacturing Automation Protocol/Technical and Office Protocol to spur development and use of other open system standards. Among the efforts being considered, they said, are campaigns to promote common interfaces for Open Systems Interconnection Layer 7 applications and standards for distributed data base management systems.

ITRC members consider such open system efforts critical for the competitiveness of North American industries.

"Japan is way ahead of us in [promoting open systems]," said ITRC member Charles Gardner, technical associate at Eastman Kodak Co. in Rochester, N.Y., and chairman of the North American MAP/TOP Users Group Steering Committee. "If standards-based technologies become more widely used in Japan than here, Japanese companies will have an edge."

Eventually, members of the ITRC want the group to play as prominent a role in promoting open systems as well-funded government and industry groups led by Japan's Ministry of International Trade and Industry (MITI) and the European Economic Community (EEC).

"We point to MITI and the EEC as examples of where we want to go," said ITRC President Donald Falkenburg at a recent press conference in Washington, D.C.

Tough competition

Gaining power on a par with MITI and the EEC will require significant growth by the ITRC. Funding for standards efforts by MITI and the EEC dwarf the budgets of the North American MAP/TOP Users Group and other user-led organizations in this country.

Among other projects, MITI has earmarked more than $100 million over the next six years for research into standards and technology for interoperable DBMSs based on the OSI model. The total amount spent on research could be more than double that if matching funds from vendors and user companies are factored in.

MITI has also budgeted roughly $400 million over the next nine years to develop common programming languages and operating systems for Japanese computers and telephone switching equipment, according to Jon Choy, senior analyst with the Japan Economic Institute, a Washington-based research group

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Firms should aspire to flexibility

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tered greater cooperation between departments, such as research and development, sales, purchasing and manufacturing, which formerly worked at cross-purposes.

Be wise: Standardize

Another symposium speaker, Index consultant John Thompson, said users that operate globally need to standardize their information systems to ensure that information flows freely.

Thompson said companies should develop a standard architecture for hardware, software, network equipment and protocols. Using the same equipment, applications and network facilities will let companies integrate their operations more efficiently over a wide geographic area and make a host of services available to customers on a worldwide basis.

"Companies that integrate their information systems globally will succeed in the 1990s," Thompson said.

Common system architectures will enable companies to relocate operations more quickly to "centers of competence," geographical areas that provide special advantages for conducting specialized operations, Thompson said. Using identical equipment and applications in all locations means systems staff can begin operations anywhere in the world with little delay, he said.

In addition, a common system creates savings through economies of scale. Companies gain greater leverage over suppliers since the size of their equipment order is much larger.

Finally, common systems enable companies to provide services that are more customer-driven.

For example, BankAmerica Corp.'s world banking group has spent the last 10 years standardizing the hardware and applications used in the bank's branches in 45 countries ("Global net offers bank int'l edge," *NW,* Feb. 20). A common system architecture enables BankAmerica to offer a series of real-time global account management services. These services are based on proprietary relational data base management software that BankAmerica developed to integrate customer service applications worldwide.

For instance, when a BankAmerica customer makes an electronic funds transfer, the global system automatically updates the customer's accounts and the bank's general ledgers in branches across the world.

Another advantage of a common system architecture is that it improves the accuracy of customer accounts and enables the bank to bring new services on-line from a central location. This enables the bank to offer new services simultaneously in all branches linked to its global net.

"Our standardized architecture allows us to aggressively market big volume services and gives us more flexibility in providing those services," said Marsha Lansman, general manager of the global banking system at BankAmerica, in an interview with *Network World.*

However, not all information systems staffers welcome the common system approach, Thompson said. Developing a standardized system architecture creates centralized control over data and network systems, thus reducing the autonomy of regional and local operations. Personnel often resist changes every way they know how, Thompson said.

"Corporations are striving after the global model," Thompson said, "but, really, it is the last thing many people in those organizations want."

ITRC sets sights past MAP/TOP

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funded by the Japanese government. This task is part of a project dubbed The Real-time Operating System Nucleus (TRON).

The EC will spend more than $500 million over the next five years to develop standards and technologies for a pan-European Integrated Broadband Network, according to Roland Huber, who is coordinating the project with the EC in Brussels, Belgium. Huber said that carriers and private companies are expected to contribute another $500 million to the effort over the same period.

It is questionable whether these efforts have given the Japanese and Europeans access to better standards-based technologies than U.S. users.

Yet, according to ITRC members, such huge expenditures have stimulated user and vendor interest in open systems, which in turn speeds open systems implementations.

In its infancy

Members of the ITRC admit that their drive to promote standards other than MAP/TOP is in its infancy. The group has made little more than general statements about other standards it wishes to promote. The bulk of its budget this year will be devoted to administering MAP/TOP efforts, Falkenburg said.

ITRC members are working toward the day, however, when they can devote more of their efforts to standards other than MAP/TOP. "I can picture a situation in five years where administering MAP/TOP takes up only half our budget," Falkenburg said.

U.S. competitiveness

Some scholars argue that the success of this and other users groups in promoting open standards could have important implications for the competitiveness of U.S. businesses.

"We [in the U.S.] tend to leave standards-setting issues up to the [free] market," said Michael Borrus, deputy director of the University of California at Berkeley's Roundtable on the International Economy. "Yet research suggests that this isn't necessarily the best approach.

"Japan and Europe don't rely on the free market [for open standards]," Borrus said. "There is a need for more coordination at the user level, especially given the aggressiveness of the Europeans and Japanese in reaching common network standards."

PRODUCTS & SERVICES

THE LATEST OFFERINGS FROM VENDORS AND CARRIERS

Worth Noting

See inside for:

- Telcom Technologies' direct-inward dial interface for ACD systems
- Amdahl DSUs that perform net management on AT&T DDS circuits
- A line of Navtel Canada protocol analyzers

First Look

PC-based card links workstations, Arcnet

LANMASTER, a division of Vestra Subco, Inc., recently announced a four-port card that connects workstations to Datapoint Corp.'s Arcnet local networks.

Called **LANMASTER Interactive Hub,** the IBM Personal Computer-based card works in star-configured Arcnet networks running Novell, Inc. ELS-I and ELS-II Advanced and System Fault Tolerant NetWare operating systems at speeds up to 2.5M bit/sec.

The ports support workstations connected via coaxial cable at distances up to 2,000 feet. A network designer can create any size local net by linking workstations equipped with the LANMASTER Interactive Hub in a daisy-chain configuration.

In addition, each port can support a passive hub that splits the communications signal into three additional lines, or ports. Each port on the passive hub can support a workstation at a distance of up to 100 feet. In this configuration, the LANMASTER Interactive Hub can support as many as 12 nodes.

The four-port card can also support up to 32 nodes in a bus network configuration. In this case, each port on the interactive hub can support eight workstations in a linear bus.

Vestra Subco also recently announced two diskless workstations that run at speeds of 16 MHz and 20 MHz, and have 512K bytes of random-access memory. Both workstations are IBM Personal Computer AT-compatible and support in-

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Davox adds new features to CVR 2000

By Jim Brown
New Products Editor

BILLERICA, Mass. — Davox Corp. recently enhanced its Computerized Voice Response (CVR) 2000 with software that forwards a call and the associated data screen to an operator when a caller using the automated voice response system requests operator assistance.

With Davox's Smart Connect software, a caller can request personal assistance during an automated voice response transaction. Data already collected by the voice response unit is transmitted to a Davox-integrated voice/data workstation along with the call.

With the data displayed on the screen, the operator can greet the caller, answer any questions and complete the transaction. The operator can also use the data collected by the CVR 2000 to retrieve the customer's entire file from a host computer.

Smart Connect informs the operator of the point in the transaction that the caller requested assistance, allowing the operator to avoid rekeying information. For example, a caller may check his bank account balance and then request operator assistance to correct a mistake. After receiving the data screen from the CVR 2000, the operator can greet the customer by name and offer assistance in helping with an account balance problem.

With other voice response systems, callers requesting help from an operator must repeat their account numbers and other information that may have already been collected by the voice response unit.

The software enables Davox to move into the inbound telemarketing arena. The company's equipment previously supported only outbound telemarketing. With outbound telemarketing, a customer's file is sent from a host to a Davox workstation that automatically dials the telephone number of the customer. If the customer answers, his data file appears on an operator's screen.

Smart Connect works with Davox's CVR 2000-resident Financial Integrated Voice and Registrator (FIVR) software. FIVR supports such banking transactions as account balance inquiry; loan payment due date and balance inquiry; and stolen credit card reporting. FIVR also supports college registration transactions such as course availability and requirements inquiry, course sign-up and tuition quotes.

> The software enables Davox to move into the inbound telemarketing arena.
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The CVR 2000 tracks the number of Smart Connect transactions and the operators to which calls are forwarded. It also tracks which agents are available for Smart Connect calls.

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DILOG unveils T-1 link for async terminals, DEC host

ANAHEIM, Calif. — Distributed Logic Corp. (DILOG) recently introduced a product that supports a local T-1 link between as many as 128 asynchronous terminals and a Digital Equipment Corp. host.

DILOG's CQ2010 is an add-on board that fits into the backplane of a DEC MicroVAX microcomputer or PDP-11 minicomputer supporting DEC's Q-Bus architecture. The board multiplexes up to 128 asynchronous terminals operating at 9.6K bit/sec or 64 terminals operating at 19.2K bit/sec onto a single T-1 line.

Micom Communications Corp. Instatrunk 480 multiplexers are used as remote distribution panels linking as many as 32 terminals.

As many as four Instatrunk 480s can be connected in daisy-chain fashion to a CQ2010. With the CQ2010 and Instatrunk 480s, terminals can be located up to 5,700 feet from the DEC host.

This configuration is an alternative to direct terminal-to-host connections.

The board and multiplexers can replace as many as eight Q-Bus controller boards and also can be used in place of an Ethernet connection between the DEC host and terminal servers.

The CQ2010 costs $3,900, and the Instatrunk 480 is priced at $3,600.

For more information, write to DILOG at 1555 S. Sinclair St., Anaheim, Calif. 92806, or call (714) 937-5700.

Centigram upgrades voice message unit

VoiceMemo software supports 1,500-system net, increases capacity of VoiceMemo II to 120 ports.

By Jim Brown
New Products Editor

SAN JOSE, Calif. — Centigram Corp. recently released upgraded software for its VoiceMemo voice-messaging system that, among other enhancements, allows a user to network as many as 1,500 VoiceMemo II and VoiceMemo VS systems.

The company also increased the capacity of its VoiceMemo II system to a total of 120 ports and 960 hours of voice storage. Previously, VoiceMemo II supported 30 ports and 40 hours of storage.

System Software 5.0 supports Centigram's Modular Expandable System Architecture-Net (MESA-Net) software. With MESA-Net, VoiceMemo system users can exchange digital voice messages with users of remote VoiceMemo systems.

Running on each node in the VoiceMemo network, MESA-Net compresses digitized speech at 18K bit/sec and transmits the voice over digital or analog lines operating at 19.2K bit/sec. Some voice systems convert digital voice messages to analog before transmission to remote voice-messaging units. This conversion can harm voice reproduction at the receiving end, the company said.

Users can attach VoiceMemo systems supporting MESA-Net to a T-1 multiplexer, thus enabling the 19.2K bit/sec MESA-Net link to be included as a channel in the T-1 bit stream.

MESA-Net also supports full-duplex transmission between VoiceMemo systems. This means a VoiceMemo system can simultaneously transmit and receive messages with a remote VoiceMemo system. This helps reduce transmission time between systems.

Another MESA-Net feature enables users to handle urgent messages. System administrators can configure VoiceMemo systems to automatically transmit urgent messages or postpone transmission until a specified number of urgent messages has accumulated. Nonurgent messages can be sent at the end of a day or when a specified number of messages has accumulated.

System Software 5.0 supports a number of other new features for stand-alone VoiceMemo systems, including urgent message delivery. With this feature, important messages are the first to be played back when users access their voice mailboxes.

The upgraded software also expands the length of the user-defined password needed to access a voice mailbox from three to 10. This makes it tougher for an intruder to crack a password. The new release also expands the length of a voice mailbox address from three to 11 digits. This expansion enables users to support a greater number of voice mailboxes in a MESA-Net network.

With System Software 5.0, users can define as many as 64 groups of users, each of which can be limited to accessing only certain VoiceMemo features.

For instance, one group of users can be limited to sending messages to a list of defined users, while another group can be prohibited from sending messages to remote users.

Because it requires the use of two disks, the disk redundancy feature limits the total hours of storage a VoiceMemo II will support to 480.

Current VoiceMemo users can upgrade to System Software 5.0 for $5,000 per system. The cost for MESA-Net is $8,000 per node

> MESA-Net also supports full-duplex transmission between VoiceMemo systems.
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and includes both the networking software and the required System Software 5.0 release. The price of both upgrades includes any required CPU enhancements.

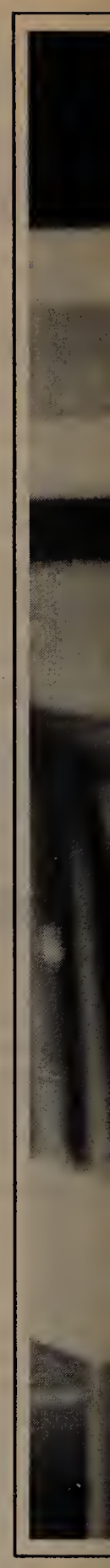
The cost for providing redundancy for a disk supporting 40 hours of storage is $22,500. That includes two disks, each of which can store as many as 40 hours of digitized voice messages.

A VoiceMemo II supporting four ports and five hours of storage costs $29,900, and a system supporting 60 ports and 180 hours of storage is priced at $320,000. A fully configured VoiceMemo II supporting 120 ports and 360 hours of storage costs $630,000.

Users can write to Centigram at 4415 Fortran Court, San Jose, Calif. 95134, or call (408) 942-3500.

"Know how much it costs to add highly trained people to your data networking staff? Nothing."

—Joe Frizzell, Manager
AT&T Data Maintenance Operation and Control Center
Dallas, Texas



"You can never have enough people overseeing your company's data transmission. That's the theory behind AT&T Data MOCCs (Data Maintenance Operation and Control Centers). Think of it as instantly having an additional staff of highly trained, experienced technicians working to back up your entire DATAPHONE® II network.

Our network and our data communications equipment are designed to work together in perfect harmony —a combination of quality and accuracy unmatched in the business.

From planning to installation, to remote network monitoring and troubleshooting, we're always there. Data MOCC technicians work with you on a regular basis tracking down problems, arranging for repair, giving you total end-to-end support to help you keep your network performing flawlessly day after day.

And the cost? If you lease or rent AT&T data communications equipment, or own it with our valid service contract, adding Data MOCC won't cost you a single penny extra. Not a bad deal, right? And it's the kind of service you couldn't buy from another vendor at any price. Because only AT&T offers it.

The highest quality products and the highest commitment to supporting them. If you think Data MOCC looks like a pretty good deal, you're right. And just think of how good you'll look for using it."

To find out how much more you get with AT&T DATAPHONE II data communications equipment, see your AT&T Account Executive, your authorized AT&T Reseller, or call 1 800 247-1212, ext. 717.

AT&T

The right choice.

First Look

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terface cards for Arcnet, Ethernet and IBM Token-Ring Networks.

When used with LANMASTER's Auto-Boot Read Only Memory chip, the workstations are automatically booted to the network. Diskless workstations prevent network users from removing sensitive or classified files from company premises or from introducing viruses or security-breaker programs using a floppy disk.

The LANMASTER Interactive Hub is priced at $395 and is available now. The diskless workstations, also available now, range in price from $999 to $1,499.

LANMASTER, 1401 N. 14th St., Temple, Texas 76501, or call (800) 441-6189.

Performance software lets IBM mainframes act as file servers

Performance Software, Inc. recently introduced software that lets IBM mainframes act as central file servers for IBM, Apple Computer, Inc. and Unix-based personal computers.

Called **MasterFile,** the software enables mainframes running DOS/VSE, MVS and CICS operating systems to distribute personal computer programs and files between personal computers or between local networks.

In addition, the software enables IBM mainframes to automatically back up and store personal computer files or entire disks. The software's management and control features provide security and audit trail capabilities, as well as a software vaccine that detects viruses and unauthorized alterations of programs.

MasterFile software is available as a stand-alone product or as an optional feature to Performance Software's MasterLink file-transfer system.

MasterFile site licenses are priced at $3,500 for DOS/VSE and $4,500 for MVS and CICS. The product will be available in April.

Performance Software, Inc., 575 Southlake Blvd., Richmond, Va. 23236, or call (804) 794-1012.

Modular muxes give users flexibility in net configuration

Universal Data Systems, Inc. (UDS) recently announced a line of modular multiplexers that give users flexibility in configuring networks.

The **Build-a-Mux** series allows users to intermix statistical and time-division multiplexers (TDM) in an eight-slot Desktop Data Shelf or a 16-slot Universal Data Shelf that supports as many as 32 ports.

Two types of multiplexer cards are supported. The TDM/MR is a TDM card that supports an aggregate data rate of 384K bit/sec, according to the company. The card requires use of a controller card that takes up one slot on the rack and supports remote configuration. Each TDM/MR card supports two ports, each of which can be configured independently.

The RM 16M-SM-A statistical multiplexer cards are available in two-, four- and eight-port configurations. A submultiplexing card statistically multiplexes output from as many as four SM-A multiplexer cards into a single synchronous data stream. Output from the eight-port Desktop Data Shelf can be fed as a single channel into the 16-slot Universal Data Shelf.

All Build-a-Mux cards have aggregate channel error detection, support RS-232 connections, operate point-to-point and support input speeds up to 9.6K bit/sec.

The products will be available in the second quarter, and prices will vary depending on configuration. A fully configured 32-port version will cost about $200 per port.

Universal Data Systems, Inc., 5000 Bradford Drive, Huntsville, Ala. 35805, or call (205) 721-8000.

Amdahl DSUs upgraded for AT&T DDS circuit testing

Amdahl Corp. recently announced that its line of data service units (DSU) performs net management tests on AT&T's Dataphone Digital Service (DDS) circuits.

Amdahl's **Enhanced DSU-A** allows network operators to perform in-band channel loop-back and bit error rate tests on DDS tail circuits connected to Amdahl's MultiStar networks. The tests are performed using Amdahl's MultiStar Network Administrator software running on a personal computer attached to the network.

The enhanced DSUs supports DDS speeds from 2,400 bit/sec to 9.6K bit/sec. The enhanced DSUs are compatible with Amdahl's MultiStar multiplexers and Racal-Milgo's Omnimux T-1 point-to-point multiplexer. In subrate versions, the unit can support speeds down to 1,200 bit/sec.

The enhanced DSUs come in stand-alone and rack-mounted models, and support subrate and 56K bit/sec network speeds. The units range in price from $880 to $1,015 and are available now.

Amdahl Corp., 2200 N. Greenville Ave., Richardson, Texas 75081, or call (214) 699-9500.

New Compuquest offerings include modem, terminal

Compuquest, Inc. recently announced a 4.8K bit/sec modem for cellular telephones and a 5-lb. terminal that emulates Digital Equipment Corp. VT-220 terminals and has a built-in 1,200 bit/sec modem.

The modem and the terminal both support the company's Compuquest Communications Protocol, a forward error-correction protocol that enables data compression and dynamic data management. Current cellular data transmission products only support 300 bit/sec and do not allow error correction, the company said.

The 4.8K bit/sec cellular modem costs $1,695, and the terminal is priced at $1,798.

Compuquest also announced a V.33 Leased Line Modem and a V.32 modem that both support the Compuquest Communications Protocol. The V.33 modem supports speeds up to 28K bit/sec and costs $3,495, and the V.32 modem supports speeds up to 9.6K bit/sec and is priced at $1,595. Both products are fully compatible with standards approved by the Consultative Committee on International Telephony and Telegraphy, the company said.

Compuquest, Inc., 801 Morse Ave., Schaumburg, Ill. 60193, or call (312) 529-2552.

Com Dev call-accounting software supports 2,500 lines

Com Dev, Inc. recently announced a new version of its personal computer-based call-accounting software that supports 2,500 telephone extensions.

Callquest III Version 1.2 includes tables for pricing calls made using MCI Communications Corp.'s Prism III and Prism Plus services, as well as AT&T Pro WATS II and III. Also, the software supports DIF-format reporting, which enables users to analyze call record data in other application programs.

Callquest III Version 1.2 includes five diskettes containing software and telephone rate tariff data.

Also included are a private branch exchange call-record cable and a proprietary front-end processor board that fits into a personal computer slot. The board can buffer up to 3,400 call records while the personal computer is shut down or being used to run other applications.

The software runs on IBM Personal Computer ATs and Personal System/2s running MS-DOS 3.1 or higher.

Prices range from $2,195 for software supporting 75 extensions to $12,995 for 2,500 extensions. The software is expected to be available starting March 1.

Com Dev, Inc., 2150 Whitfield Industrial Way, Sarasota, Fla. 34243, or call (813) 753-6411.

Fax gateway introduced for cc:Mail E-mail system

Software developer **cc:Mail, Inc.** is scheduled to introduce a facsimile gateway for its electronic mail system this week.

Called **cc:Mail FAXlink,** the software is designed for use with Intel Corp.'s Communications CoProcessor board, which is installed in a single workstation on a local network. That workstation serves as a gateway between the users on the net and all CCITT Group III facsimile devi

A cc:Mail user can route a message user not on the E-mail network if that user has a facsimile device. The gateway does this by converting the user's E-mail message to a facsimile transmission.

The new product supports the company's flagship cc:Mail for IBM Personal Computers and the newer Macintosh version. The gateway is bidirectional, enabling Personal Computer and Macintosh users to receive and view facsimile documents as well as transmit them.

Incoming documents can be viewed, saved as files, routed to other recipients on the cc:Mail network or printed.

FAXlink enables users to build directories of users on the local network and users with remote facsimile devices. Once those directories have been set up, users can address cc:Mail messages to recipients by name. The gateway then routes the message to the appropriate recipient, even if it has to dial a facsimile machine and transmit the message as a facsimile.

Priced at $995, the cc:Mail FAXlink gateway is scheduled to ship this June. It will require an upgrade to cc:Mail 3.1 and

cc:Mail Gateway 3.1, both of which will also be available in June.

cc:Mail, Inc., 385 Sherman Ave., Palo Alto, Calif. 94306; (415) 321-0430.

Navtel Canada preps protocol analyzer line

Navtel Canada, Inc. is expected this week to unveil a line of protocol analyzers.

The company's **9440** and **9460** protocol analyzers test IBM Systems Network Architecture, X.25, Integrated Services Digital Network Basic Rate Interface, asynchronous, Binary Synchronous Communications and synchronous protocols. The analyzers monitor more than 600 statistics in real time, including total call packets, aborts and selective rejects.

The 9440 model monitors data at 64K bit/sec, and the 9460 monitors data at 72K bit/sec. Both capture data in a continuous storage buffer at 1M bit/sec. When the buffer is full, they continue to store data by copying over the oldest data in the buffer.

The units perform bit error rate testing for ISDN protocols at speeds up to 64K bit/sec. The bit error rate testing conforms to a variety of telephone standards. The units translate the results of bit error rate tests into English statements, such as "excellent" or "unacceptable."

Both units come with their own hardware, proprietary software with full protocol-decoding capability and a data capture disk that inserts into a disk drive on the hardware.

Using terminal emulation, the units shrink a full 24- by 80-in. terminal display onto a smaller LCD screen. This enables test operators to see full test results without having to page to different parts of the display.

Network interfaces for the units include RS-232, V.35, X.21 and ISDN Basic Rate Interface.

The 9440 protocol analyzer, priced at $5,495, is available now. The 9460, priced at $7,495, will be available in June.

Navtel Canada, Inc., 55 Renfrew Drive, Markham, Ont., Canada L3R8H3, or call (416) 479-8090.

Aspect software update enables CallCenter ACD to serve as PBX

Unit now supports up to 96 single-line, 2500-type phone sets.

By Jim Brown
New Products Editor

SAN JOSE, Calif. — Aspect Telecommunications is expected today to release enhanced operating system software that will enable its Aspect CallCenter automatic call distributor (ACD) to act as a private branch exchange and support enhanced call detail recording.

With Aspect CallCenter Release 2.1 software, CallCenter ACD supports as many as 96 single-line, analog 2500-type telephone sets. For some users, this can obviate the need for a small PBX or key system, according to Aspect. Since the telephones are linked to the CallCenter ACD, they can handle ACD calls when all other agents are busy.

The new software supports PBX-like features, including call holding, call transfer, conference calls, speed dialing, call forwarding, last number redial and station message detail recording. Attached telephones can also utilize CallCenter ACD's integrated voice mail and voice response functions.

A voice response message informs the caller whether the phone is forwarded to another extension, forwarded to voice mail or has voice messages waiting. Users can hear voice messages instructing them how to perform such functions as call transfer and call forwarding.

Business Application Management

Also included with Aspect CallCenter Release 2.1 is Business Application Management software. This enables users to monitor the ACD transaction functions that the CallCenter ACD has been configured to support. Typically, ACD management software monitors and tracks calls by agent group or incoming trunk group; therefore, it only informs users of overall ACD usage, not the type of transactions callers performed.

CallCenter ACDs can be configured to support a number of transaction types. For instance, one agent group can handle sales calls, while another can handle customer service or product information calls.

Each of those groups may have different service thresholds. For instance, users may want most sales calls to be answered within 10 seconds, while most other calls can be answered within one minute.

Business Application Management tracks each call coming into each agent group. The software details such things as the length of time calls were held in queue, talking time and total holding time. In addition, the software can track calls transferred from one agent group to another.

For example, the software can report what portion of a call was dedicated to product inquiry before the caller requested transfer to sales. Then it tells what portion of the call was devoted to the sales transaction. Other systems would log the entire call as a product inquiry call.

Business Application Management can also log calls made to CallCenter ACD's voice response unit; other systems log calls not answered by an agent as abandoned. CallCenter ACD's voice response unit can support such transactions as account balance inquiry and order entry.

The software also supports a forecasting function that helps users determine the number of agents needed to support each transaction type.

Support for 24 terminals

Call detail data is displayed in real time on an administrative terminal attached to a CallCenter ACD port via an RS-232 line. CallCenter ACD supports as many as 24 terminals. Call detail data can also be stored in a data base for later analysis.

Aspect CallCenter Release 2.1 will be distributed free of charge to existing CallCenter ACD users and will be included on all new CallCenter ACDs at no charge.

Aspect will also release a single-line analog telephone that will work with the CallCenter ACD. This telephone features preprogrammed feature access buttons and costs $89.

Aspect can be reached by writing to 1733 Fox Drive, San Jose, Calif. 95131, or by calling (408) 279-5511.

Davox adds new features to CVR 2000

continued from page 29

Used stand-alone, the microprocessor-based CVR 2000 plays voice prompts asking callers to enter data from push-button telephones. The CVR 2000, which supports up to 16 lines, can appear to a private branch exchange as telephone extensions.

The CVR 2000 communicates with asynchronous or synchronous host computers to retrieve data from customer files. That account information is translated to speech by the CVR 2000 and read back to the caller.

The CVR 2000 connects to an asynchronous host via an RS-232 line operating at up to 19.2K bit/sec. When communicating with a synchronous host, such as an IBM mainframe, the CVR 2000 is linked via RS-232 to a Davox master synchronous controller at up to 19.2K bit/sec. The master synchronous controller is also linked to an IBM front-end processor port at up to 56K bit/sec. That master controller is an IBM 3274-type device that converts between asynchronous data streams and IBM 3270 data streams.

To support Smart Connect, the CVR 2000 passes data collected from a caller to a Davox asynchronous controller via an RS-232 link. That asynchronous controller forwards the data to a Davox-integrated voice/data workstation. The CVR 2000 then instructs the PBX to forward the telephone call to the Davox workstation-attached telephone.

Davox's workstations are intelligent IBM 3270-type devices with asynchronous and synchronous communications ports. The integrated telephone attaches to a PBX.

Several Davox workstations are connected to the CVR 2000-attached asynchronous controller. Those workstations can also be attached to a Davox master synchronous controller. Operators requiring additional information to answer questions or complete transactions can access the customer's entire file using data contained in the CVR 2000 asynchronous data stream and Smart Button software.

Davox workstation-resident Smart Button software enables users to define a single key that invokes a series of commands. For instance, a Smart Button can be used to log onto an IBM host and retrieve a customer's file. Davox workstations can support four concurrent synchronous and five concurrent asynchronous sessions.

Smart Connect software costs $5,000 for users with one CVR 2000 and $8,000 for users with multiple CVR 2000s. A typical 16-line CVR 2000 with two Davox workstations, controllers, FIVR and Smart Connect software sells for $100,000.

Davox can be reached by writing to 3 Federal St., Billerica, Mass. 01821, or by calling (508) 667-4455.

OPINIONS

ISDN

BY ED WARD

It's all happening at the zoo — the NIU Forum

There's a new group in our industry that users should check out. No, it's not another standards committee or vendor-sponsored users group. In fact, this new group can best be compared to a zoological society.

Like most zoological societies, this one helps support a public zoo, complete with elaborate habitats that simulate actual environments. Here, various exotic specimens are displayed for the entertainment and education of the viewing public. The habitats also protect the specimens from predators and other environmental hazards.

What makes this zoo unique is that all of its specimens are hybrids, descended from existing creatures yet different from them. Specimens such as these exist nowhere but in this remarkable zoo (although this naturally leads to some debate about how well the habitats simulate a real environment).

> Various exotic specimens are displayed for the entertainment of the viewing public.
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And, unlike the general public, the society's members can go behind the scenes and talk with the keepers. In this way, they can learn details about the specimens' breeding, feeding, behavior, strengths, special talents and limitations that they can't learn anywhere else. The society even helps its members open new habitats and become keepers themselves.

This society is the North American ISDN Users' Forum, and the habitats the members are helping to develop are called trials. Within these trials, members learn about fragile young technologies while keeping them safe from the predatory, competitive environment of corporate telecommunications.

Although the trials are largely public processes, the forum allows its user members to interact with the product developers so they can better understand the various breeds of Integrated Services Digital Networks. Moreover, the forum assists users in evaluating ISDN's potential within their own companies and in setting up their own trials.

The forum is sponsored by the National Institute of Standards and Technology (NIST) to help ensure that ISDN, as implemented in North America, meets the real-world business needs of users. As an agency of the Department of Commerce, NIST's task is to help this new technology become an effective commercial tool. To make that happen, NIST has set up the forum as a means of defining users' needs and communicating those needs directly to the vendors that will ultimately implement the appropriate technological responses.

The forum also recognizes that the priorities and problems of one industry, such as manufacturing, may be different from those facing another industry, such as financial services. For this reason, different industry working groups have been established to focus on the needs of specific industry segments. This structure gives the group the market clout of a large user organization while allowing it to maintain the attention to specific user needs that smaller groups can offer.

The forum is committed to helping users develop whatever breed of the ISDN beast is best suited to their needs and set up trials in which to study that breed's habits. In this protected environment, users may find that their pets grow so large, so swift and so strong that they can be readily harnessed to drive productivity gains throughout the users' organizations.

Interested in joining? Then call Kim Brashears of NIST at (301) 975-4853. Tell her you want to talk with the animals.

Ward is network services manager at American Management Systems in Arlington, Va.

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EDITORIAL

What are the rights of telephone users?

Privacy issues surrounding the automatic number identification (ANI) capability of ISDN have raised a storm of controversy and have already led some companies to mask use of the feature. But the cauldron is just beginning to boil. Telephone users' rights brought into question by ANI will be debated from state public utility commissions right up to Congress.

ANI can be frightening to the uninitiated. Callers are accustomed to being able to hide behind telephones. With ANI, however, the number of the caller is delivered with the call, enabling ANI users to query a data base and identify the caller before answering.

Some telemarketing firms learned the hard way that using the technology to its logical extreme — personalizing service by greeting callers by name — alarmed customers. According to an early ANI user, one customer was so shocked at being greeted by name that he paused for a few seconds to contemplate the situation and then asked, "How did you know who I was?"

The Big Brother analogies are obvious.

One issue at the heart of the controversy is whether consumers have the same basic rights to telephone service as they do to other utilities.

New Jersey Bell Telephone Co., one of the first Bell operating companies to offer ANI services to the general public, will pass the telephone numbers of callers to any ANI subscriber, even if the caller has an unlisted number. The BOC does not offer consumers the option of blocking ANI number-forwarding. If they don't like it, their only recourse is to cancel phone service.

Imagine if gas utilities attempted to make money selling consumer information in a manner that was offensive to many customers — perhaps selling to conservation groups the names of consumers that use more than their fair share of energy. If customers balked, would the utility be within its rights to say, "If you don't like it, buy a wood stove"?

> Is it fair for the local carriers to present consumers with "take it or leave it" service decisions, in which the only benefactors are businesses and carriers?
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Probably not. Should it be different with telephone "utilities"?

John Kauza, AT&T's Integrated Services Digital Network product manager, argues that all innovations have side effects and that the common benefits of ANI will outweigh any privacy shortcomings ("Providers of ANI face privacy hurdle," *NW*, Dec. 19, 1988).

But Kauza is eyeing the common good from a business vantage point. He says ANI could save business users 10% to 30% on overall marketing costs by reducing the length of calls and the number of operators needed, and by creating data bases that could be used elsewhere within a company or sold to third parties.

While that claim may be true, it smacks of exploitation. It looks like the customer — who is being tagged and tallied with ANI — will have no say in the matter.

The ANI controversy involves more principle than reality. ANI works only with inbound calls. As Kauza says, the vast majority of people calling corporate ANI users fully intend to identify themselves anyway.

But principles being what they are, a question begs asking: Is it fair for the local exchange carriers (who originate ANI information) to present consumers with "take it or leave it" service decisions, in which the only benefactors are businesses, which stand to save money, and carriers, which stand to make money?

We cannot and should not stand in the way of technological advancement, but we owe it to consumers to present options, not shove technology down their throats.

OPINIONS

DOCUMENTATION

BY RONALD MISKIE

Not a 'necessary evil,' but a valuable resource

Few vendors, MIS or data processing professionals appreciate technical documentation, and even fewer appreciate the contribution that documentation specialists make to an organization. Some, though not many, appreciate the skills required to develop documentation such as instructional materials, operations manuals and system design methodology.

Companies that employ documentation professionals often expect them to plan, develop and produce a book "like magic." What's more, vendors, MIS and DP professionals often do not make a connection between outdated, ineffective or nonexistent documentation and the high cost of developing or redeveloping systems.

For instance, how much time and money has been spent rewriting programs or reconfiguring systems because documentation didn't exist or was outdated? How much does it cost to train a new employee because the knowledge of the system, program or procedure was "in the head" of a former employee? How often, during the development of a system, has a lack of documentation resulted in misunderstandings and redesign efforts?

The answers to these questions provide some insight into the millions of dollars users spend because of inadequate documentation.

Vendors are now beginning to realize the role that good documentation can play in reducing support costs and increasing sales. Those that truly appreciate their users and consider their product from the user's point of view usually provide usable documentation.

But vendors that plan, develop and write truly user-oriented documentation are the exception in the industry, not the rule. Many vendors still think in technical terms rather than from a user perspective, and their documentation reflects this.

The attitude of vendors, MIS and DP professionals toward documentation is the root of the problem. As long as documentation is viewed as a costly "necessary evil" rather than as a beneficial, results-producing tool, its quality and usefulness will suffer.

Even with the introduction of documentation tools such as word processors, computer-based training, on-line documentation products and desktop publishing hardware and software, documentation and documentation professionals still assume the lowest priority in many vendor companies.

> Vendors that write truly user-oriented documentation are the exception.
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Often, vendors adopt the attitude that, "We have to do it, so let's do what will get us by for now." More often than not, documentation is completed in the eleventh hour — barely days before the system is implemented — and users are trained on the fly.

But this may be changing soon. The documentation profession is growing, as vendors hire more documentation specialists. Documentation as a sales, support and training tool is evolving. But still, vendors, MIS and DP professionals must be educated and convinced of documentation's worthiness. We have a long way to go.

Documentation and training materials must be designed and produced to enable users to:

- Perform their jobs and produce intended results.
- Provide information to superiors, clients, coworkers and others.
- Train themselves and others.
- Communicate the benefits, value and applicability of their products, systems and businesses.
- Contribute constructively to their companies' futures.

When technicians such as engineers, scientists, programmers and systems analysts develop a product, they are responsible for explaining how it can, or will, be used and for communicating this information to their colleagues.

Therefore, technicians must first explain the product to other technicians using their language.

Once this has been accomplished, the benefits of the technician's product must be explained to users who will need to understand:

- How it works.
- How to repair, change or modify it.
- How and when to use it.
- How it fits into their job.
- What difference it will make to the company, its employees, clients and so on.

This information must be communicated to users in their own language, which is different from that of the technicians. In other words, a product wouldn't be explained to an auditor in the same way that it would be explained to another technician.

If documentation and training are not created at each step of the process, from the design concept to the actual use of the product, the likelihood of the product being used incorrectly will increase. As a result, users — frustrated and resentful about being improperly trained — may resist implementing any new products in the future.

Documentation specialists provide the link between design and implementation and are responsible for explaining products, operations, procedures and so on in a way that will produce results. Here are but a few measurable and tangible benefits of results-oriented documentation:

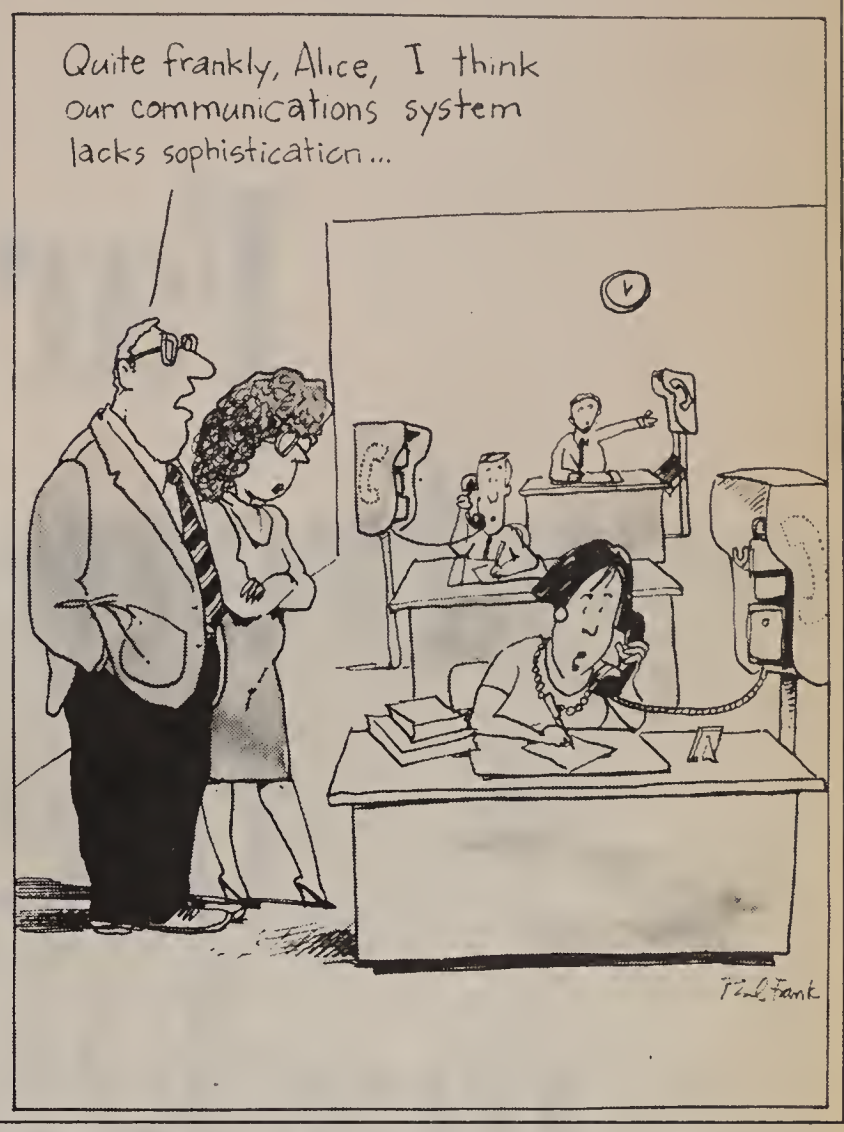
- Reduced development costs.
- Reduced product support costs (hardware and software).
- Reduced training and start-up costs associated with new employees (faster return on investment).
- More motivated and productive technicians, developers, programmers and analysts.
- Increased sales.
- Increased productivity, better understanding and a reduction in human interface implementation problems.

Until companies recognize the value, usefulness and benefits of documentation and documentation professionals, there will be little chance for documentation to have any measurable impact upon productivity, the costs of doing business and profitability.

Miskie is chairman of the Association of Documentation Specialists, 520 Eighth Ave., New York, N.Y. 10018. The association can be contacted at (212) 594-8323.

TELETOONS

BY FRANK AND TROISE



LETTERS

History repeats itself

I read with interest the recent interview with Bill McGowan of MCI Communications Corp. ("McGowan knocks FCC's 'piecemeal deregulation,' " *NW,* Feb. 6). As they say, history has a way of repeating itself. I can remember when MCI was just a dream in McGowan's future as he interconnected private lines from downstate Illinois through a switchboard in Chicago to the local private branch exchange trunks of Illinois Bell.

At the time, such a connection was a tariff violation. As I remember, McGowan was quite outspoken and possibly bitter over AT&T's and Illinois Bell's objections.

Now here we are some 20 years later. AT&T finds it necessary to use flexible tariffs to meet obvious marketplace needs while carrying U.S. District Court Judge Harold Greene's decisions on its back.

It didn't seem to bother McGowan then, when he was in the catbird seat. I can't understand why it seems to bother him now, when the roles are reversed.

What's sauce for the goose should be sauce for the gander!

Richard Kuck
La Jolla, Calif.

(continued on page 50)

Network World *welcomes letters from its readers.*

Letters should be typed, double-spaced and sent to Editor, Network World, *375 Cochituate Road, Box 9171, Framingham, Mass. 01701.*

Letters may be edited for space and clarity.

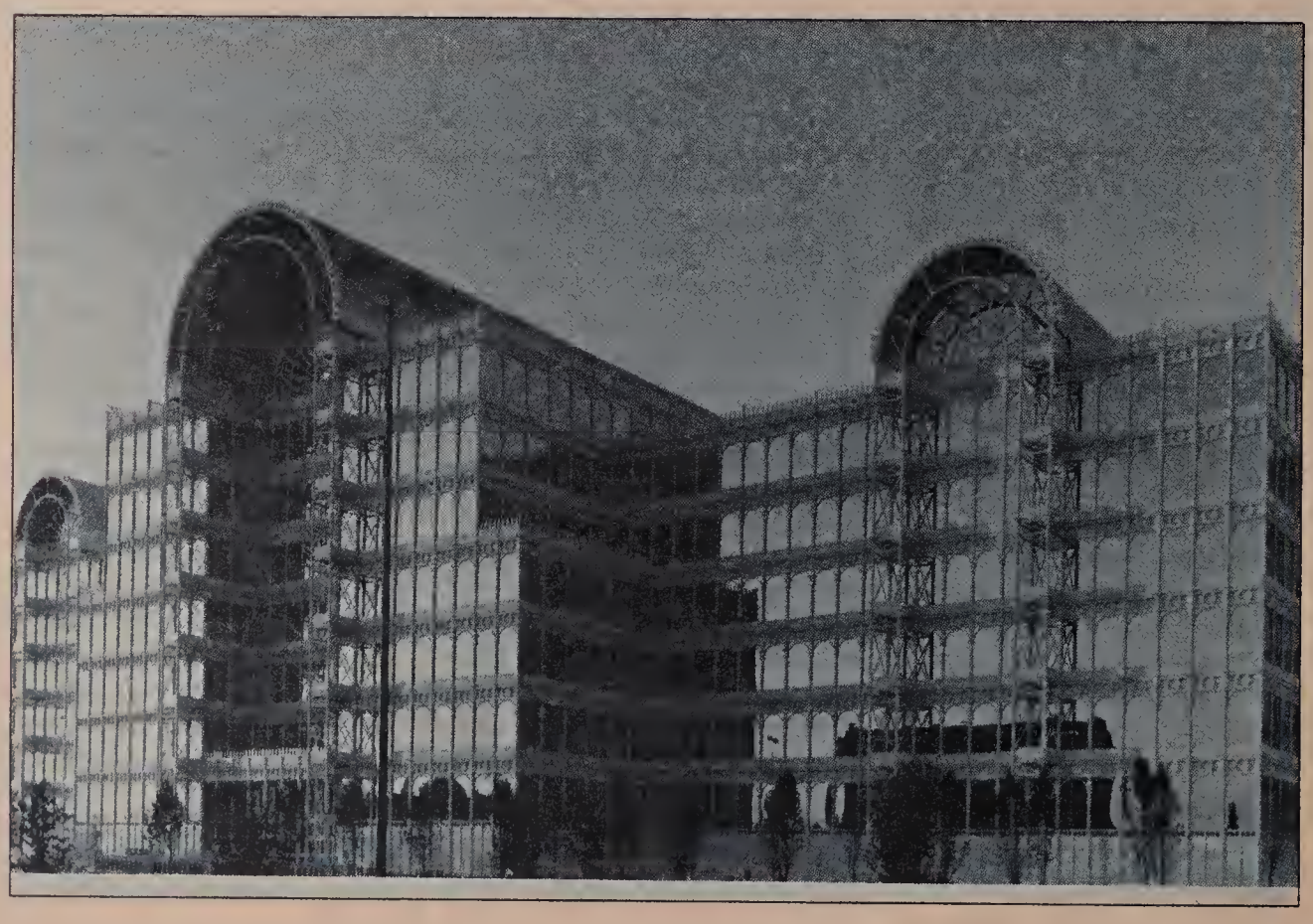
WE'RE NOT ASKING YOU TO BECOME a streaming terminal. We don't want you to communicate with us at 19.2K bit/sec. All we want is for you to write a guest column for *Network World's* Opinions pages. C'mon — it's time to rev up your throughput and get your disk drive in gear.

Columns should be timely, opinionated, literate, thoughtful and accurate. Manuscripts should be letter-quality, double-spaced and between 600 and 900 words in length. Disk or modem submissions are preferred.

If you'd like to write a column, contact Steve Moore, features editor, *Network World,* Box 9171, Framingham, Mass. 01701, or call (508) 820-2543, ext. 732.

Far from the madding crowd

By EMILY KAY



Permanent exhibits at high-tech malls allow users quality time to learn about products.

Top:
Techmart,
Santa Clara, Calif.

Bottom:
Infomart, Dallas

As the Communication Networks Conference and Exposition '89 fades into memory and the portable exhibition booths are dismantled and stored until the next extravaganza, communications vendors hope the leads yielded by the one-week show will result in actual sales.

After fighting their way through the crowded aisles to visit as many booths as possible, the potential buyers of networking and telecommunications products and services have returned to their companies to determine if they gathered enough data to make informed, long-term buying decisions.

Far from the madding crowds, the proponents of permanent exhibition facilities for technology vendors are selling the idea of these so-called high-tech trade marts as an adjunct — and, in some cases, an alternative — to frenetic trade shows.

Kay is a free-lance writer based in Chelmsford, Mass.

A sense of permanence

The hectic atmosphere of trade shows, trade-mart advocates argue, makes it extremely difficult for buyers to learn about, evaluate and choose the right communications product for their business. The trade-mart setup, on the other hand, encourages users to shop among competing vendors in a more efficient fashion and to educate themselves about how one supplier's solutions stack up against another's, according to proponents.

"A trade show is a temporary event for which you set your show materials up, tear them down and then store them until the next show," says Franklyn Thiebaud,

(continued on page 38)

Top:
Inside the Infomart

Middle:
Inforum, Atlanta

Bottom:
Techworld,
Washington, D.C.

PHOTOGRAPHY COURTESY OF INFOMART, INFORUM, TECHMART AND TECHWORLD

(continued from page 37)
manager of customer communications centers for Xerox Corp. in Dallas. "In a market center, you establish a permanence, and you can do more things than you can in three days at a trade show."

The interaction between buyers and sellers is of higher quality in market centers as well, Thiebaud adds.

"Product centers are established to showcase the equipment," he says. "You have permanent staff with a level of expertise to discuss that equipment. From a user standpoint, it's a more unhurried, professional shopping experience compared to a trade show, which can be hectic."

Avoiding the hard sell

For the most part, users want to learn what communications solutions will meet their requirements; they don't want a hard sell, observers say.

"Most users say they can go to major vendors for education, but they know there's a hidden agenda. The vendors want to sell them their products," says Rich Mauro, vice-president of marketing for Inforum, a trade mart scheduled to open in September in Atlanta. "A trade mart allows for unbiased education" because many similar products are in one location, he adds.

> "It's a more unhurried, professional shopping experience compared to a trade show," Thiebaud says.
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Users are looking for this unbiased education when they visit trade centers, and vendors must give it to them to be successful, says Joyce McKee, vice-president of B.R. Blackmarr & Associates, a management consulting firm in Dallas that studies high-tech trade marts for its clients.

"[Showroom personnel] know an individual can walk out and go to anyone else, so they need to be responsive and try to meet the requirements customers are placing on them," McKee says.

Vendors agree that purchasers come to trade centers for the whole picture, not a proprietary sales pitch. "If a customer is doing his job right, he's going to visit with other vendors [in the mart]," says Dick Terrell, operations manager for Xerox at Infomart, a trade mart in Dallas. "No one vendor has all the answers in this business."

The future beckons

The concept of a centralized location where suppliers and users can interact on a year-round basis is gaining advocates in both camps; however, the mixed response to high-tech trade marts and the fact that only one — Infomart — has been successful thus far indicate it's an idea whose time has not yet come.

Its time, however, may be coming soon. Two more marts — Inforum and Techworld in Washington, D.C. — are set to open later this year. They will have the advantage of being able to learn from the experiences of their predecessor in Dallas.

Infomart opened in 1985 and experienced some early problems — debuting at a time when the computer industry was in decline, for one. However, observers now believe the center, which has an occupancy rate of about 55%, is on the road to success. More than 300,000 potential buyers are expected to visit the 1.5 million-sq.-ft. facility this year. Infomart provides its tenants with a choice of single offices, suites, demonstration space and product showrooms.

> The real test of a trade mart's success is its tenants' bottom line, and Infomart appears to be passing that test, according to recent surveys.
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The real test of a trade mart's success is its tenants' bottom line, and Infomart appears to be passing that test, according to recent surveys by B.R. Blackmarr and Associates and Price Waterhouse, a Dallas accounting and consulting firm.

Both surveys showed that vendors have increased revenues through their Infomart efforts. Twenty-five of the 60 Infomart tenants that responded to the Price Waterhouse survey last year attributed a total of $217 million in sales to a combination of their own efforts and their presence at Infomart, according to William Winsor, president and general manager at Infomart..

Terrell backs up the survey results. Based on a thorough study of expected traffic through the mart, which translates into a certain number of demonstrations,

leads, orders and actual sales, Xerox has "absolutely exceeded its expectations," Terrell says. Xerox has its full array of networking solutions available at Infomart, which has led to at least one substantial order recently, he says.

Terrell recalls how, after attending an Infomart-sponsored event, a customer from the federal government entered Xerox's showroom looking for a specific network solution. After three days of visiting other vendors' showrooms, and three subsequent visits to Xerox, the customer bought more than $1 million worth of Xerox equipment, he says. "He says we showed him how he could solve his particular problem," Terrell says.

"If you have a facility, a product and a knowledgeable staff that can understand and then show a potential customer how to [solve a specific problem]," he says, "you're simplifying the decision process for the customer."

Always something new

Dennis Magill, vice-president of data processing for American General Group, a health insurance company in Dallas, has been pleased with the service he's sampled at Infomart. "The more you use the facility, the better it gets, because you become familiar with the vendors and the new technologies. And every time you go over there, there's something different happening," he says. "Now every time something new to the trade comes out, [Infomart] is the first place I'll look. It saves a lot of shopping time."

And to stay current with the industry, Magill says he uses the free educational seminars that Infomart vendors offer, such as those on microencoding for laser jet printers that he recently attended.

Magill says American General initially investigated Infomart for disaster recovery planning assistance. His company selected Gary Kirkum, a consultant with an office in the Infomart building. "It was comforting to know that Infomart was behind, but not necessarily endorsing, Gary — making us aware of who he is and what he can do, and that created confidence [in him]," Magill says.

"Every time something new to the trade comes out, [Infomart] is the first place I'll look. It saves a lot of shopping time," says American General's Magill.

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Dave Molta, manager of academic computing at North Texas State University in Denton, says he uses Infomart "for a variety of purposes. We're a large Novell [Inc.] site, and they've been very helpful in working with us and allowing us to see some of their new products [at Infomart] as they come through the pipeline."

Molta says that the university has also taken advantage of the free seminars offered by various Infomart vendors. "We sent some people down there for some desktop publishing seminars and to look at new scanner technology, and we do find [Infomart] to be very useful." Molta adds that while he would not recommend that someone "hop on a plane and fly to Dallas just to go to Infomart," the facility's location, 45 minutes from the university, makes it ideal for him.

Ted Coontz, a systems engineer with Electronic Data Systems Corp. in Denver, is a confirmed attendee of NetWorld, an annual networking show sponsored by Novell and held at Infomart. "The real drawing point, what really pulled us down there, was the fact that it's the biggest collection of networking companies I've seen together," says Coontz, whose company is a large user of Novell's personal computer local-area network equipment. "Just about every company we deal with is there. And there are lots of ways you can arrange meetings with the different vendors."

One method that gets users and vendors together is Infomart's much-praised executive briefing service.

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Getting info to users

One method that gets users and vendors together is Infomart's much-praised executive briefing service. The mart asks buyers to outline their communications needs, then schedules a briefing date and informs the tenants, which may decide to present the users with their solutions in a personalized forum. Novell attributes much of its success at Infomart to its participation in these briefings, says Peggy Burt, the company's showroom manager in Dallas.

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"We're one of the most requested showrooms," Burt says. "Participation in the program can pay for our existence here."

A constant stream of qualified traffic visiting a mart is key to its success, mart managers stress. Infomart's year-round program of events and services can help bring in such buyers for vendors that are willing and able to work with the trade center's marketing staff, observers agree.

"It's up to the showroom if they respond to requests for information on executive briefings and participate in all the vertical market shows," Burt says. "I'll respond to requests even if there's only a remote chance they might want to see me, on the chance that somewhere down the road they might need a LAN. It's an opportunity to get my information in front of the right people."

Cooperation between the mart staff and the sellers is crucial to a vendor's success, says Burt, who attributes the 50% annual increase in NetWorld attendance since 1986 to the efforts of Novell and Infomart.

> Burt attributes the 50% annual increase in NetWorld attendance to the efforts of Novell and Infomart.
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One vendor not so enthralled with her company's tenancy at Infomart is Dolly Salsky, area sales manager for CASE/Datatel Communications Products, Inc., a T-1 multiplexer manufacturer headquartered in Cherry Hill, N.J. Salsky says she is working with the Infomart staff to increase its telecommunications marketing efforts. Most Infomart visitors are looking for personal computer local nets, not telecommunications solutions, she says.

"Some people like me aren't finding the kind of leads we would like to find, but [the Infomart staff] seems to be willing to work with us," Salsky says. "When there are shows, people come by asking us for information, but they're not banging down the doors."

If she had more time to attend executive briefings and if there were more tenants in the facility, Salsky says she might have more success at Infomart.

Problems with Techmart

Infomart's immediate successor, Techmart, which opened in 1987 in Santa Clara, Calif., hasn't yet achieved Infomart's level of success. Considered a hybrid market center not totally devoted to high-tech companies, Techmart has suffered serious financial problems. Missing most from Techmart are "buyer-delivery" efforts similar to Infomart's executive briefings.

"Infomart has done an excellent job of soliciting people to come to the center," B.R. Blackmarr and Associates' McKee says. "That's not the case in a place like Techmart. They have good educational seminars and some traffic, but they haven't had the [endorsement] of some of the major players in the industry."

Indeed, not only have dominant vendors such as IBM declined to rent space at Techmart, but Novell pulled out of its space there because Techmart dropped its marketing staff, according to a Novell official.

Some networking vendors simply use the upscale Techmart space as a regional or district sales office. "Being in a ritzy building like Techmart gets us exposure, but we have few people stop by the office," says John Anthony, customer service manager for Banyan Systems, Inc.'s Northwest district. "We have large installed bases, and we more often than not bring potential customers to those sites for demos."

> "Tenants of Techmart can do things they can't do in other buildings in Silicon Valley," Fippinger says.
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Techmart's financial problems may keep people away, some observers say. "Techmart has only a 40% occupancy, which makes it like a ghost town," Anthony says. "There's a perception that Techmart is having big problems."

Making the facility operational has taken longer than expected, according to Robert Fippinger, Techmart's executive director. The building is 50% occupied, he says.

"Any 50% occupied building isn't making money, but we're still in the development phase," he says. "We won't be up and running until we're totally leased."

Techmart had to extend the terms of its construction and development loan because of the slow rental pace, says Fippinger, who notes that the facility provides services not available from other office buildings. "Tenants of Techmart can do things they can't do in other buildings in Silicon Valley," he says. "Meetings, con-

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DATACOM

BUYER'S GUIDE

MODEMS FASTER THAN 9.6K BIT/SEC

Revving up the data pump

Trends toward higher speeds and combinations of technology are driving the modem market boom.

CONTINUED FROM PAGE 1

and other data to send between remote sites and headquarters.

"At times, we're driving three 300-line-per-minute printers, along with up to 16 asynchronous users, over conditioned leased lines from here to Talladega, Ala.," says Dave Hickman, data processing manager for International Speedway. "We've run jobs of 40 to 60 hours of continuous printing at times."

International Speedway uses BT Datacom 4142 TCX V.33 modems to transmit and receive data at speeds up to 14.4K bit/sec. "We've actually run at 14.4K over voice-grade lines," Hickman says, but he adds that such cases are unusual. With operating overhead, speeds are usually closer to 14.1K bit/sec, he says, adding, "We've only had to fall back to 9.6K once."

Hickman's experience is unusual among users of 14.4K bit/sec and faster modems. Few high-speed — 14.4K and 19.2K bit/sec — modems actually operate so close to their top listed speed, whether because of line conditions or inflated performance claims by vendors. Often, conditions must be close to perfect to achieve top speeds. Paul Hathaway, systems programmer for McLane Co., Inc., a food processing firm based in Temple, Texas, uses the same BT Datacom 4142 TCX modems as International Speedway but over dial-up lines. "We're getting 14.4K on occasion," Hathaway says, "but the norm is probably 9.6K."

Chart Guide

The features and prices of various modems faster than 9.6K bit/sec are listed in a chart starting on page 45.

The need for speed

Most users aren't complaining yet about lack of performance — at least, not loudly. The high-speed modem market is booming, as is the general modem market.

Figures from Frost & Sullivan, Inc., a New York-based research firm, indicate that the total number of modems in use will continue to increase into the 1990s. Growth in production will probably push unit prices down, so that the total market value may actually fall over the

(continued on page 42)

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next few years (see Figure 2, page 50).

According to International Data Corp. (IDC), an information technology research and consulting firm in Framingham, Mass., the values of the 14.4K and 19.2K bit/sec modem markets have grown by more than 20% and 14%, respectively, since 1986.

Josh Gonze, research analyst for IDC, foresees market growth at both 14.4K and 19.2K bit/sec, but more at 19.2K bit/sec. He predicts that the two markets will continue to outperform the rest of the modem market (see Figure 1, page 50). Why? Because users need speed.

Gonze doesn't see new or different applications at the high end of the modem market, just the need to pump more information through the lines. "Users simply have more and more data to transmit," he says. Until recently, users have been buying more 14.4K than 19.2K bit/sec units.

Minimal cost

"I believe the trend will actually be for users to skip over 14.4K and go to 19.2K," Gonze predicts. "When a user upgrades from 9.6K, he or she typically goes to 19.2K. It's just not that much more expensive to go to the higher speed," he adds. "It's the same trend noticed when users began skipping over 4.8K on their way from 2,400 to 9.6K."

However, upgrading to 19.2K bit/sec isn't for everyone. "It's the elite users who have particular need for high speeds and sophisticated modems that are upgrading to 19.2K," Gonze explains.

"Over the next year or so, we can look for the 19.2K market to grow," adds Joe Cortese, division manager for data communications and multiplexing products at AT&T in Bridgewater, N.J. Cortese looks for the entire high-speed market to expand rapidly.

"There are a number of things happening that make higher speeds more practical," he explains.

"Signal processing is getting better, and the costs associated with it are going down. You can get V.32 modulation at higher speeds using better modulation algorithms," Cortese says. "On top of that, developments in data compression should give users levels of throughput two to five times what they could get without compression. And finally, the emergence of digital backbone networks will give users an inherently cleaner net to operate on."

Gonze echoes other analysts, users and vendors when he asserts that the 14.4K bit/sec market will lose out to higher speeds in the future.

In their view, such modems may become the quadriphonic eight-track tape players of the 1990s: good equipment that is quickly made obsolete by advancements in the field. Meanwhile, many users are still buying 14.4K bit/sec modems.

Strengths

Most attribute the current strength of 14.4K bit/sec modems to two traits: age and standardization. The slower technology has been around longer. It also has the CCITT V.33 standard, which the higher speed units do not have.

V.33 defines operating characteristics for leased-line, full-duplex modems operating at speeds up to 14.4K bit/sec. It includes the use of trellis-coded modulation (TCM) and echo-cancellation schemes to provide error-free transmission (as much as possible, at least) at the designated operating speed.

Modems using TCM and its predecessor, quadrature amplitude modulation (QAM), identify transmitted data using "constellation points." These are groups of signals representing the data in certain places on a

> Modems at 14.4K may become the quadriphonic eight-track tape players of the 1990s: good equipment that's made quickly obsolete.
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two-dimensional "map" in the modem's processor. The receiving modem matches the positions of the received constellations on its own two-dimensional map, identifies the relative positions of the points and puts the received data in the right order.

TCM adds coding information that QAM does not. TCM breaks every seven data bits into groups of five bits and two bits. The group of two bits is encoded using an extra data bit. The two groups are then put back together and transmitted. The extra bit links the complete group of eight bits to the following group to be transmitted. This assures that the receiving modem will arrange the received data in the correct order.

Once the data is received and verified as complete through the coded bits, the coded bits are filtered out by the receiving modem and the data is stored in the receiving computer.

Is it really V.33?

Although V.33 has been accepted as a standard, many vendors also offer some sort of proprietary modulation scheme: either their own version of V.33, a combination of V.33 and V.32, or a truly proprietary scheme, in addition to TCM and QAM.

BT Datacom is one such vendor. Its 4142 TCX modem uses a proprietary echo-cancellation program to boost error-free transmission speeds. The modem is actually based on V.32 leased line, 9.6K

(continued on page 44)

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(continued from page 42)
bit/sec technology.

"It's a combined V.32 and V.33," explains Max Arafa, major account manager at BT Datacom.

"It's V.32-extended, which means that we're squeezing a lot more out of V.32. We've been able to make V.32 work down to 4.8K bit/sec and up to 14.4K bit/sec," he says.

"The bottom line is, how good your modem is depends on how good your echo-cancellation technique is," Arafa continues. "Ours is proprietary technology. We're not using anybody else's data pumps or chips."

Arafa says BT Datacom is addressing the leased-line users that also want dial backup. "Very often, we come across people who just want to use the product for dial-up applications," he says.

Rockwell International Corp., while not a retail modem vendor, manufactures the chipsets and data pumps for a majority of high-speed modem vendors. Bill Conway, Rockwell International's product line manager for high-speed data modems, agrees with Arafa regarding user needs and operating speeds.

"A lot of the applications we're seeing are with the V.29 [vendor], who's interested in a V.33 with a V.32 fallback," Conway says. "Whether they're going to use it as a V.33 modem or as a V.29/V.32 product is up in the air."

Both Conway and Arafa see a trend toward "universal modems," at least at 14.4K bit/sec and slower. "People are interested in not just one particular speed or CCITT standard but in a combination," Conway states. "What users want to see is one modem that will enable them to support a wide variety of standards." He adds that Rockwell International sees this trend in image and facsimile modems as well as in straight data pumps.

Most vendors in the accompanying chart, which begins on page 45, offer not only a multispeed modem but options such as multiplexing, dial- or leased-line fallback, and autodial capability with number storage. This trend toward combining technologies within one modem — or using plug-in feature modules — also helps explain why the prices are so much higher than in the lower speed markets.

Proprietary versions of V.33 may be one reason why users are beginning to pass over the 14.4K bit/sec products in favor of 19.2K bit/sec offerings.

"I've never heard of two 14.4K modems from different vendors working together," says IDC's Gonze, adding, "I don't think anyone even tries it."

> "How good your modem is depends on how good your echo-cancellation technique is," Arafa says.
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He believes that the lack of vendor support for the V.33 standard may be driving users to higher speed modems. "It's just not that much more expensive," he says.

The leading edge of data transmission is 19.2K bit/sec. Very few vendors offer modems operating at higher speeds; such modems are mostly for very specialized applications.

As usual, vendors aren't waiting for an international standard to begin product development. The CCITT is considering V.34 for 19.2K bit/sec modems, but it doesn't seem inclined to hurry.

According to Jim McGill, a delegate to CCITT Working Group XVII (the modem group), a draft recommendation has been approved for V.34. McGill is also vice-president of product development for Telebit Corp., a Cupertino, Calif.-based manufacturer of high-speed dial-up and leased-line modems. He warns that it may be a while before V.34 is approved as an international standard.

"The standard operating procedure is a four-year approval cycle," McGill explains. "We have just begun the next four-year cycle. Under the usual procedure, standards developed during the

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Modems faster than 9.6K bit/sec (continued on page 48)

Vendor	Model	Transmission speeds (bit/sec)	Interface	Modulation	Transmission standard	Line type	Clocking	Transmission mode	Features	Diagnostics	Line conditioning required	Price and packaging	Warranty
Anderson Jacobson, Inc. San Jose, Calif.	1941-ID	19.2K, 16.8K, 14.4K, 12.2K, 9.6K	RS-232-C, V.24	QAM	V.33, proprietary	4-wire leased	Synchronous	Full-duplex on 4-wire leased line	Autodialing, autodial backup, adaptive equalization, 2-number storage for autodial backup	ST, LAL, RDL, LDL	None; AT&T Type D suggested	$3,795 stand-alone, $3,595 card only, $4,470 rack-mounted	1 year
Ark Electronic Products, Inc. Melbourne, Fla.	LL733	19.2K, 16.8K, 14.4K, 12.2K, 9.6K	RS-232-C, V.24	TCM	V.33	4-wire leased	Synchronous	Full-duplex	TCM error correction, adaptive equalization, 2-channel integral multiplexing	ST, RAL, LAL, RDL, LDL	AT&T Type D	$3,995 stand-alone	2 years
AT&T Bridgewater, N.J.	Dataphone II 2192A	19.2K, 14.4K, 9.6K	RS-232-C	QAM, TCM	Proprietary	4-wire leased	Synchronous	Full-duplex	QAM, TCM error correction, automatic adaptive equalization, 6-channel integral multiplexing	ST, RAL, LAL, RDL, LDL, O	AT&T Type D	$9,920 stand-alone, $9,500 rack-mounted	1 year
BCH Equipment Corp. Largo, Fla.	14.4/M, 14.4/S	14.4K	RS-232-C	QAM	Proprietary	4-wire leased	Synchronous	Half-duplex, full-duplex	Adaptive equalization, 4-channel integral multiplexing	ST, LAL, RDL, LDL, O	None	$2,995 stand-alone and rack-mounted	1 year
BT Datacom Chantilly, Va.	4142 TCX	14.4K, 12K, 9.6K	V.24, V.28, RS-232-D	TCM	V.33, V.32	2-wire leased, 4-wire leased, dial-up	Asynchronous, synchronous	Full-duplex	Autodialing, autodial backup, adaptive equalization, 4- or 6-channel integral TDM, 4- or 8-channel statistical multiplexer, 4- or 8-channel PAD (all optional), 2-number storage	ST, LAL, RDL, LDL	AT&T Type C	$2,495 stand-alone and rack-mounted	1 year
CASE/Datatel, Inc. Columbia, Md.	4192	14.4K, 12.2K, 9.6K	RS-232-C, V.24	QAM, TCM, proprietary	V.33, V.35	4-wire leased	Synchronous	Full-duplex	Adaptive equalization, 6-channel integral multiplexing	ST, RAL, LAL, RDL, LDL, O	AT&T Type D	$7,495 stand-alone, $7,295 rack-mounted	2 years
Codex Corp. Canton, Mass.	2680	19.2K, 12.2K	RS-232-C	TCM, proprietary	Proprietary	4-wire leased	Asynchronous, synchronous	Full-duplex	Autodialing, autodial backup, TCM error correction, adaptive equalization, 6-channel integral multiplexing, 4-number storage, password, encryption security	ST, RAL, LAL, RDL, LDL, O	AT&T Type D	$7,200 stand-alone, $7,275 rack-mounted	2 years
Coherent Communications Systems Corp. Hauppauge, N.Y.	Linemate SPM-195	19.2K, 14.4K, 12.2K, 9.6K	RS-232-C	FSK	Information not provided	2-wire non-loaded loop	Asynchronous, synchronous	Full-duplex	1 data channel, 1 voice channel integral multiplexing	ST, LAL, RDL	None	$325 stand-alone, $275 rack-mounted	1 year from installation or 1½ years from factory ship date, whichever comes first
Concord Data Systems, Inc. Marlborough, Mass.	DialAccess 296 modem	19.2K, 9.6K	RS-232-C, V.24, V.28	QAM, TCM, PSK	V.32	2-wire leased line, 4-wire leased line, dial-up	Asynchronous, synchronous	Full-duplex	Autodialing, error correction with MNP Class 2, 3, 4, 5, adaptive equalization, 10-number storage (up to 80 characters each), password security	ST, LAL, RDL	None	$1,795 stand-alone	2 years
Data Race, Inc. San Antonio, Texas	V.33/32 Mach Modem	14.4K, 9.6K	RS-232-C	TCM	V.33, V.32	4-wire leased	Synchronous	Full-duplex	Autodialing at 9.6K, autodial backup, adaptive equalization, 4- or 8-channel integral multiplexing, 3-number storage (up to 64 characters each)	ST, RAL, LAL, RDL, LDL, O	None	$1,800 stand-alone, $1,700 rack-mounted	1 year
Digicom Systems, Inc. Milpitas, Calif.	9624LE	19.2K, 9.6K	RS-232-C	TCM	V.32	2-wire leased, dial-up	Asynchronous, synchronous	Full-duplex	Autodialing, MNP Class 5 error correction, adaptive equalization, 10-number storage, callback security	ST, RAL, RDL, LAL, LDL, O	None	$795 stand-alone and rack-mounted	2 years
Digital Pathways, Inc. Mountain View, Calif.	DEF-245 Dual High Speed Modem	18K*	RS-232-C	PEP	Propnetary	Dial-up	Asynchronous	Half-duplex	Autodialing, PEP error correction, adaptive equalization, 1,000-number storage (32 characters each), callback security, password	ST, RAL, RDL, LAL	None	$3,000 (two modems/card, integral to the firm's Defender II callback security system)	1 year
Fastcomm Communications Corp. Reston, Va.	FDX 9696	38.4K, 19.2K, 14.4K, 12.2K, 9.6K	RS-232-C, V.24, V.28	FSK, PSK, QAM, TCM	V.32	2-wire leased, 4-wire leased, dial-up	Asynchronous, synchronous	Full-duplex	Autodialing, autodial backup, MNP Class 4 error correction, adaptive equalization, 6-number storage, password security	ST, RAL, LAL, RDL, LDL, O	None	$1,299 stand-alone, $1,279 to $1,299 rack-mounted	2 years
Fujitsu America, Inc. Data Communications Division San Jose, Calif.	LN 19.2	19.2K, 16.8K, 14.4K, 12.2K, 9.6K	RS-232-C, V.24, V.28	TCM (proprietary)	Proprietary	4-wire leased, dial-up (option)	Synchronous	Full-duplex	Autodialing, optional autodial backup, adaptive equalization, 2-channel integral multiplexing (8 optional), 2-number storage transmit, 2-number storage receive (32 characters each)	ST, RAL, LAL, RDL, LDL, O	AT&T Type D	$6,995 stand-alone, $6,795 card	1 year

FSK = Frequency shift keying
LAL = Local analog loop-back
LDL = Local digital loop-back
MNP = Microcom, Inc.'s Microcom Network Protocol
O = Other diagnostics
PAD = Packet assembler/disassembler
PEP = Telebit Corp.'s Packetized Ensemble Protocol
PSK = Phase shift keying
QAM = Quadrature amplitude modulation
RAL = Remote analog loop-back
RDL = Remote digital loop-back
ST = Self test
TCM = Trellis-coded modulation
TDM = Time-division multiplexing

* Uses data compression to achieve throughput above 9.6K bit/sec.

(continued from page 44)
next four years — including V.34 — would not get final sign off until November 1992, which is a long time away."

McGill adds that there is an accelerated procedure under which recommendations can be approved, but "it's too late to get it done in time for the March 1989 meeting for V.33 because of rule changes made in November [1988] that weren't made known to us until it was too late to do anything about it." V.34, as well as the V.42bis data compression recommendation, will have to wait at least until the fall to be eligible for the accelerated procedure. If that happens, both could be standards by the end of the year.

Jack Humphrey, general partner of TeleQuality Associates, feels strongly that the CCITT should be taken to task over its slow approval of faster speeds. TeleQuality is an engineering and consulting firm in Golden, Colo., that tests and evaluates modems for users and vendors.

"The political situation gets my dander up," Humphrey says. "Where is the next-generation modem engine for the 1990s? It should be written by now; it should have gone to [the CCITT] plenary session already." Humphrey offers the opinion that the European post, telegraph and telephone administrations exerted their influence to slow high-speed modem standards due to their development of digital services, such as Integrated Services Digital Network.

"I think the PTTs said in the early 1980s, 'Hey, ISDN is coming, and the whole world will go digital. We'll do V.32 and V.33, and that will be the end of the dial world,' " Humphrey says. He adds that he believes the lack of standardization at 19.2K bit/sec and above may hurt U.S. users and vendors in the long run.

McGill agrees. "I think the industry and [vendors] would be better off if there was a standard," he says.

V.34 reflects the overall trend toward combinations of technology. According to McGill, it is a draft recommendation for a high-speed dial-up modem combining some 14.4K bit/sec single-carrier technology with some 19.2K bit/sec multicarrier technology into a modem modulation technique that runs at multiple speeds.

McGill adds that "V.34 has been the primary task of Working Group XVII for the last couple of years." Vendors involved in the group include Telebit, Rockwell, Paradyne Corp. and U.S. Robotics, Inc..

Data compression is the big item of discussion among vendors and users. Several vendors in the chart, including Hayes Microcomputer Products, Inc. of Atlanta, achieve speeds of 14.4K bit/sec or higher only through some form of compression.

The big squeeze

Most forms of data compression are based on some type of bit-robbing or substitution, such as Huffman encoding. The state of the art appears to be the Lempel-Ziv (LZ) algorithm, developed in Europe for British Telecommunications plc. The algorithm is the heart of the BTLZ data compression method described in CCITT draft recommendation V.42bis.

Modems using LZ are capable of effective throughput up to five times that of modems using no compression, according to McGill and AT&T's Cortese.

"We feel Lempel-Ziv is going to be one of the big data compression standards within the next 12 months," Cortese says. As mentioned earlier, the V.42bis recommendation is awaiting approval by the CCITT; it may be an official standard by the end of 1989. The standard will be applicable to more than just high-speed modems or modems using the V.42 error-correction protocol.

"We feel Lempel-Ziv is going to be one of the big data compression standards within the next 12 months," AT&T's Cortese says.

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"[V.42bis] should be applicable to any base modulation," McGill says. "There have been some test results presented to the CCITT for these data compression algorithms. A typical collection of office files transmitted with BTLZ can be compressed about 2½ to three times. This would effectively turn a 2,400 bit/sec modem into a 7.2K bit/sec modem." Such results can be equaled at 14.4K bit/sec and 19.2K bit/sec, according to Cortese and Humphrey. Humphrey maintains that such technology should allow vendors to produce modems that pump data at speeds usually restricted to digital transmission.

"There's no reason why we can't push at least the Basic Rate of ISDN — 2B+D — over today's analog lines," Humphrey states. "You're not going to do full ISDN or T-1 over those lines, but there's a long way to go before we reach the analog limit."

Cortese counsels caution to those who expect such high rates. "With some of the enhancements in technology, you might be able to get up to 32K bit/sec on an analog line," he says. "There's an absolute limit of 64K on [AT&T] digital lines. But the local loops on each end are going to keep users from getting that high."

If users have the right type of conditioned leased lines, noise-free and close enough to a central office so that repeaters aren't necessary, a higher rate is probably possible, he adds. "But it takes a lot, including a time-compression technique, to

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INDUSTRY RESEARCH SERIES

NETWORK WORLD

PC COMMUNICATIONS '89

Moderator: Bruce Hoard, *NetworkWorld*
T. Travers Waltrip • Charles Lamberson
William F. Zachman • Larry DeBoever

March 23, 1989
11:30am - 4:00pm EST

• Benefits

Can you answer these questions?

- What is the best kind of local area network for personal computers?
- How easy and expensive is it to link disparate personal computers on a local area network?
- What is the current state of the art in micro-to-mainframe links?
- How can MIS managers make sure various personal computer networks are integrated with corporate networks?
- How does OS/2 and LAN manager fit into the overall systems applications architecture (SAA) picture?
- How can you evaluate network operating systems?
- How truly networkable is Apple's Macintosh?
- How can users make the best use of repeaters, bridges, routers and gateways?
- How does the IBM PC environment compare to the Mac PC environment?
- How does Structured Query Language fit into the communications picture?
- PC futures: What's beyond 386 technology? What's the future for imaging and CDROM?

• Purpose

According to International Data Corp. 6.2% of PCs were networked in 1986 while 66.9% will be networked by 1992. The burden of this radical shift in use will fall directly upon the shoulders of MIS and communications managers. The purpose of this seminar is to familiarize both technical management and staff with the various hardware and software methods of networking PCs, with a hard look at advantages and disadvantages.

• Audience

This seminar is designed for all technical managers, engineers and technical staff responsible for corporate telecommunications and data communications, whether it be in the MIS or communications departments.

Syllabus

Local Area Networks

- The Promise and Reality of IBM's Token Ring
- How AT&T's Starlan Competes
- Is IBM Working on Ethernet Support?
- Apple's Networking Protocol

Network Operating Systems

- Microsoft's MS-DOS
- Banyan's Vines
- Novell's Netware
- 3Com's 3Plus

Wiring

- The Potential of Twisted Pair
- The hazards of IBM and Northern Telecom's Cabling Systems and AT&T's PDS

Control

- How to Take Control of Isolated Work Area Networks
- Integrating LANs Network Management
- How to Cut Through Vendor Claims

3270 Emulation

- Irma Grows Old

PC Servers

- Dedicated versus Nondedicated PCs
- Multiuser Software Packages
- Network Security
- Getting the Best Price Performance
- IBM versus the World

T. Travers Waltrip

T. Travers Waltrip is vice president of Telecommunications with the Travelers in Hartford, CT., a position he has held since joining the company in 1983. His current responsibilities include all hardware, software and facilities; all voice and data requirements; and all planning, design and implementation and operations. He manages a team of over 200 professionals and an annual operating budget of $200,000,000.

Charles Lamberson

Charles Lamberson is a systems analyst at E.I. Du Pont de Nemours in Wilmington, DE. He has been involved with data communications for several years, first in mainframe networks and most recently in local area networks. He has just completed leading the effort to install a 700-user Token Ring local area network, which is connected to multiple vendors' mainframes.

William F. Zachmann

Will Zachmann is president of Canopus Research, an information industry market research and consulting company. Formerly senior vice president at International Data Corp., he writes PC-related columns for a number of computer industry publications, and frequently speaks at trade shows and conferences.

Larry DeBoever

Larry Deboever is president of Deboever and Associates, a consulting and seminar company. Larry consults for a number of large clients, including Microsoft, and is currently conducting a DEC-to-IBM connectivity conference.

IBM

IBM will provide an appropriate speaker from its Token Ring Network product management group.

Apple Computer, Inc.

Apple will also provide an appropriate speaker to discuss Apple connectivity, including its Appletalk LAN and Macintosh links to DEC and IBM.

Modems faster than 9.6K bit/sec (continued from page 45)

Vendor	Model	Transmission speeds (bit/sec)	Interface	Modulation	Transmission standard	Line type	Clocking	Transmission mode	Features	Diagnostics	Line conditioning required	Price and packaging	Warranty
Gandalf Data, Inc. Wheeling, Ill.	LDM 192	19.2K, 16.8K, 14.4K, 12.2K, 9.6K	RS-232-C, V.24, V.28	QAM, TCM	Proprietary	4-wire leased	Asynchronous, synchronous	Full-duplex	Adaptive equalization, fast poll support	ST, LAL, RDL, LDL	None	$2,695 stand-alone, $2,495 rack-mounted	1 year
General DataComm, Inc. Middlebury, Conn.	DataComm 19202	19.2K, 16.8K, 14.4K, 12.2K, 9.6K	RS-232-C, V.24, V.28	TCM, proprietary	Proprietary	4-wire leased	Asynchronous, synchronous	Half-duplex, full-duplex	TCM error correction, adaptive equalization, 2-channel integral multiplexing, password security, optional autodial backup	ST, LAL, RDL, LDL, O	AT&T Type D1	$4,250 stand-alone, $4,150 rack-mounted	1 year
Hayes Microcomputer Products, Inc. Atlanta	V-series Smart-modem 9600	19.2K, 9.6K*	RS-232-C	Information not provided	V.32	Dial-up	Asynchronous, synchronous	Half-duplex	Autodialing, LAP B, V.42 error correction, adaptive equalization	ST, LAL, RDL, LDL, O	None	$1,299 stand-alone	2 years
IBM White Plains, N.Y.	IBM 7861 Model 047	19.2K, 14.4K	RS-232-C, RS-232-D, V.24, V.28	QAM, TCM	V.33	4-wire leased	Asynchronous, synchronous	Full-duplex	Optional autodial backup, TCM error correction, adaptive equalization, 2- or 4-channel integral multiplexing	ST, RAL, LAL	None	$7,200 stand-alone, $6,900 rack-mounted	1 year
Incomm Data Systems Wheeling, Ill.	Superlink 14.4	14.4K	RS-232-C, V.24, V.28	TCM	Information not provided	4-wire leased	Synchronous	Full-duplex	Autodialing, autodial backup, adaptive equalization, fast poll support	ST, RAL, LAL, RDL, LDL, O	AT&T Type C	$2,295 stand-alone	2 years
Memotec Data, Inc. North Andover, Mass.	IDM 14FP	14.4K, 12.2K, 9.6K	RS-232-C, V.24, V.28	QAM, TCM	V.33	4-wire leased	Asynchronous, synchronous	Half-duplex, full-duplex	Autodial backup, adaptive equalization, optional 6-channel integral multiplexing, optional 10-number storage, fast poll support	ST, RAL, LAL, RDL, O	None	$6,500 stand-alone, $6,400 rack-mounted	1 year
Micom Communications Corp. Simi Valley, Calif.	MM-A192-1	19.2K, 16.8K, 14.4K, 12.2K, 9.6K	RS-232-C, V.24, V.28	QAM, TCM	V.33, proprietary	4-wire leased, dial-up	Synchronous	Full-duplex	Autodial backup, adaptive equalization, 2-number storage, password security	ST, RAL, LAL, RDL, LDL, O	AT&T Type D	$4,275 stand-alone	3 years
Microcom, Inc. Norwood, Mass.	QX/V.32c	38.4K, 19.2K, 16.8K, 14.4K, 12.2K, 9.6K*	RS-232-C	FSK, PSK	V.32	Dial-up	Asynchronous, synchronous	Full-duplex	Autodialing, autodial backup, MNP error correction, adaptive equalization, 9-number storage, password and callback security	ST, RAL, RDL, LDL	None	$1,799 stand-alone and rack-mounted	1 year
NEC America, Inc. Data and Video Communications Systems Division San Jose, Calif.	SPN 1927SM	19.2K	RS-232-C, V.24, V.28	QAM, TCM	Proprietary	4-wire leased	Synchronous	Half-duplex, full-duplex	Autodial backup, TCM error correction, adaptive equalization, 6-channel integral multiplexing, 2-number storage	ST, RAL, LAL, RDL, LDL, O	None; AT&T Type D recommended	$7,495 stand-alone	1 year
NET/ComDesign Santa Barbara, Calif.	CM Series 1440	14.4K, 12.2K, 9.6K	RS-232-D, V.24, V.28	QAM, TCM	V.33	2-wire leased, 4-wire leased	Synchronous	Half-duplex, full-duplex	Forward error correction per V.33, adaptive equalization	ST, RDL, LAL, LDL	None	$1,995 stand-alone	1 year
Okidata Mt. Laurel, N.J.	CLP 14.4	14.4K	RS-232-D, V.24, V.28	QAM, TCM	V.33	4-wire leased, dial-up (option)	Synchronous	Half-duplex, full-duplex	Autodial backup, adaptive equalization, 2-number storage (36 characters each)	ST, RAL, LAL, RDL, LDL, O	None	$1,995 stand-alone	1 year
Paradyne Corp. Largo, Fla.	3400 Series	19.2K, 16.8K, 14.4K, 12.2K, 9.6K	RS-232-D	QAM, TCM, proprietary	V.33, proprietary	4-wire leased	Asynchronous, synchronous	Half-duplex, full-duplex	Autodialing, autodial backup, TCM forward error correction, adaptive equalization, 2-, 4-, 8-, 9-, 15-, 16-channel integral multiplexing, 2-number storage	ST, RAL, LAL, RDL, LDL, O	AT&T Type D1	$6,300 to $12,110 stand-alone, $6,000 to $6,470 rack-mounted	1 year
Racal-Milgo Sunrise, Fla.	Omnimode 14.4 FP	14.4K, 12.2K, 9.6K	RS-232-D, V.24, V.28, O	QAM, TCM	Proprietary	4-wire leased, dial-up	Asynchronous, synchronous	Half-duplex, full-duplex	Autodialing, autodial backup, adaptive equalization, 6-channel integral multiplexing, 2-number storage, password, callback and encryption security, fast poll support	ST, RAL, LAL, RDL, LDL, O	AT&T Type D	$4,145 stand-alone, $3,765 rack-mounted	1 year
Tek-Com Prentice San Jose, Calif.	TC 1928	19.2K, 16.8K, 14.4K, 12.2K, 9.6K	RS-232-C, V.24, V.28	TCM	Proprietary	4-wire leased	Synchronous	Full-duplex	Adaptive equalization	ST, RAL, RDL, LAL, LDL	AT&T Type D	$4,995 stand-alone, $4,945 rack-mounted	2 years
Telebit Corp. Mountain View, Calif.	T2500	19.2K, 16.8K, 14.4K, 12.2K, 9.6K	RS-232-C	FSK, PSK, QAM, TCM	V.32	2-wire leased, dial-up	Asynchronous, synchronous	Half-duplex, full-duplex	Autodialing, MNP Class 5 and PEP error correction, adaptive equalization, 10-number storage	ST, LAL, RDL, LDL	None	$1,695 stand-alone and rack-mounted	1 year

FSK = Frequency shift keying
LAL = Local analog loop-back
LAP B = Link Access Procedure B
LDL = Local digital loop-back
MNP = Microcom, Inc.'s Microcom Network Protocol
O = Other diagnostics
PEP = Telebit Corp.'s Packetized Ensemble Protocol
PSK = Phase shift keying
QAM = Quadrature amplitude modulation
RAL = Remote analog loop-back
RDL = Remote digital loop-back
ST = Self test
TCM = Trellis-coded modulation

* Uses data compression to achieve throughput above 9.6K bit/sec.

(continued on page 50)

(continued from page 46)
make the signals look like full-duplex. That would give you pretty close to 2B+D."

Goodbye to modems?

It's impossible to discuss high-speed modems at length without considering the effect of digital transmission services upon the modem market. Conventional wisdom says that modems will disappear when fiber-optic cables are strung to every home and office. Fortunately for modem vendors, that isn't likely to happen soon, if at all. There are millions of miles of copper wire strung between central offices and user locations that may never be replaced. Duane Smith, product line manager for image modems at Rockwell International, claims that "there are some communities in the U.S. and Canada that still talk over lines installed personally by Alexander Graham Bell."

> Most high-speed modem vendors are working on some sort of combination unit.
>
> ▲▲▲

At this point, it's most likely that digital services between central offices will be installed by local carriers. Long-distance carriers will install digital services between their own points of presence. Users in areas with digital service will be able to request it, but at a premium price for installation. Such lines will probably be leased from the local carrier. These users will then have to change their modem equipment to fiber or other data service unit/channel service units and change their data interfaces as well. The relatively high costs of such a switch may keep users happy with their modems for a long time.

The vendors, analysts and users interviewed for this article see the digitization of U.S. telephone lines as helping the modem market grow, at least initially. All agree that a digital backbone network would probably drive modem sales, due to the higher speeds and cleaner throughput.

"You're going to be able to push a lot more data," says AT&T's Cortese. "We think the opportunity is tremendous at higher speeds." Telebit's McGill and other vendors echo this sentiment.

What will the top speeds be? No one agrees. TeleQuality's Humphrey says that the standard dial-up line "runs out of gas somewhere around 120K bit/sec. Still, 80K bit/sec is achievable with today's technology; a number of vendors are actively trying to produce such devices."

While no one will hazard a guess as to where it will end, there is a definite trend toward what most call "combination modems." At its simplest, the concept of a combination modem encompasses half- and full-duplex operation within one box operating at speeds from 300 bit/sec to 19.2K bit/sec, with some sort of echo cancellation and data compression. Modular plug-in options include multiplexing, network management, and remote configuration and control. Many vendors listed in the accompanying product comparison chart already offer some of these value-added features.

Most high-speed modem vendors are working on some sort of combination unit; several plan to announce such units by the end of 1989. All declined to officially release information on future products for this article.

At a more complex level are the combined analog/digital units, which would allow the use of either type of circuit, depending on user needs. Cortese offers this scenario:

"The ideal world for us would be to build a box that you could just pop a module into and connect to anything. If you want to go digital today, OK; if you want to run analog tomorrow, fine. It's something that we certainly think is the way to go. It's not really new technology, it's the ability to integrate into one platform all the variety of things you need and still protect the investment in hardware at the customer site. You need an architecture that's flexible yet robust enough to do it all."

Cortese declines to say whether AT&T or any other vendor is actually developing such a product. He does say, however, that "the practicality of doing it is growing as the technology prices drop."

These dropping prices leave users that are looking to move to faster modems in a quandary. When is the right time to buy new equipment, and what's to be done with the old?

"We paid more for our [9.6K bit/sec modems] than we could get for them today," says McLane's Hathaway. "The price has dropped so much, we could probably get about 20% of what we paid." Still, he doesn't regret making the investment in higher speeds. "The older modems are still in place as second-tier backup units if we ever need them." As long as data communications exists, so also will the need for redundant systems.

Humphrey offers users some basic guidelines for determining when to switch to the fast lane.

"It's a question of 'When do I gotta do it?' " he says. "Anything man can put in silicon will come down an awesome price curve; the longer you wait, the higher the

(continued on page 50)

Let the buyer understand

Few matters in communications are as misunderstood — or at least misapplied — as baud rate vs. bit/sec, and rated speed vs. actual throughput of data. MIS managers, communications managers, consultants and vendors all use the terms interchangeably, when in fact they mean very different things.

■ **Bit/sec** is one of the simplest measures in data communications. It's also called the modem's data rate. On the surface, it's simply the amount of data, measured in bits, that a modem can transmit in one second.

A modem's listed data rate should not be considered an absolute, however. Many modems list a top speed that has never been reached under real-life conditions.

Indeed, many vendors list a theoretical data rate based on the capabilities of the technology; the modem itself may never have reached such a rate during lab testing or in the field.

At the other extreme are modems with actual throughput numbers greater than the published data rate, sometimes by as much as 300%. The higher numbers should be taken with several grains of salt. Some vendors publish a data rate of 9.6K bit/sec while claiming an effective throughput of up to 38K bit/sec.

As with data rate, many such claims are based on theoretical maximums allowed by the technology. In this case, the technology is various data compression schemes, all of them proprietary.

Skepticism toward such claims is often a healthy attitude, according to analysts, consultants and at least one vendor's technical director, who says, "Don't buy a 9.6K bit/sec modem looking to get 19.2K bit/sec throughput. It may be technically possible, but it's about as likely as your dog whelping kittens."

■ **Baud rate** is a measure of signaling speed in data transmission. It is *not* the amount of data sent through a modem; it is the *speed* at which the data is transmitted.

Baud is measured in the number of signaling elements, or symbols, that are transmitted by one modem and received by another. Advanced encoding techniques used in most higher speed modems allow several bits of data to be encoded in each signaling element or symbol.

At higher speeds, baud rate can differ greatly from bit/sec; at the lowest speeds, the two are often similar and sometimes identical. Thus, it's possible to buy a 300 baud modem with a throughput of 300 bit/sec.

It's also possible, however, that a 300 baud modem may have a throughput greater than 1,200 bit/sec.

— Bruce Guptill

NETWORK WORLD

Modems faster than 9.6K bit/sec (continued from page 48)

Vendor	Model	Transmission speeds (bit/sec)	Interface	Modulation	Transmission standard	Line type	Clocking	Transmission mode	Features	Diagnostics	Line conditioning required	Price and packaging	Warranty
Universal Data Systems, Inc. Huntsville, Ala.	1450	14.4K, 12.2K, 9.6K	RS-232-C, V.24	QAM, TCM	V.33	2-wire leased, 4-wire leased, dial-up	Synchronous	Half-duplex, full-duplex	Autodialing, TCM error correction, adaptive equalization	ST, RAL, LAL, RDL, LDL, O	None	$2,195 stand-alone, $2,095 rack-mounted	1 year
U.S. Robotics, Inc. Skokie, Ill.	Courier HST Dual Standard	14.4K, 12.2K, 9.6K	RS-232-C	FSK, PSK, QAM, TCM	V.32, proprietary	2-wire leased, dial-up	Asynchronous, synchronous	Full-duplex	Autodialing, MNP Classes 1, 2, 3, 4, 5 error correction, adaptive equalization, 4-number storage	ST, LAL, RDL, LDL, O	None	$1,595 stand-alone and rack-mounted	2 years
Ven-Tel, Inc. San Jose, Calif.	Pathfinder 18K 19.2	18K	RS-232-C	FSK, QAM, proprietary (PEP)	Proprietary	2-wire leased, dial-up	Asynchronous	Full-duplex	Autodialing, CRC and MNP error correction, 10-number storage	ST, RAL, LAL, RDL, LDL, O	None	$1,399 stand-alone	1 year

CRC = Cyclic redundancy check
FSK = Frequency shift keying
LAL = Local analog loop-back
LDL = Local digital loop-back
MNP = Microcom, Inc.'s Microcom Network Protocol
O = Other diagnostics
PEP = Telebit's Packetized Ensemble Protocol
PSK = Phase shift keying
QAM = Quadrature amplitude modulation
RAL = Remote analog loop-back
RDL = Remote digital loop-back
ST = Self test
TCM = Trellis-coded modulation

This chart includes a representative selection of vendors in the high-speed modem market. Most vendors offer other modems, and many vendors not included offer a full range of competitive products.

NETWORK WORLD CHART

(continued from page 49)

quality and the lower the price for it.

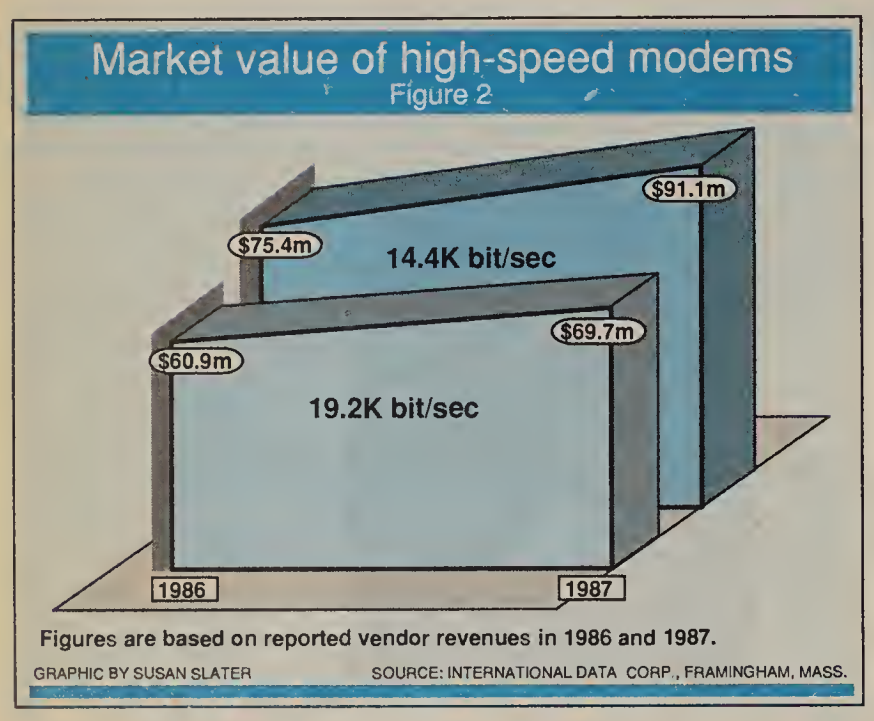
"If, on paper, the stuff cost-justifies itself in a two-year period, then what are you waiting for? In some cases, the amounts and types of data to be transmitted are of such value that the payback is almost instantaneous."

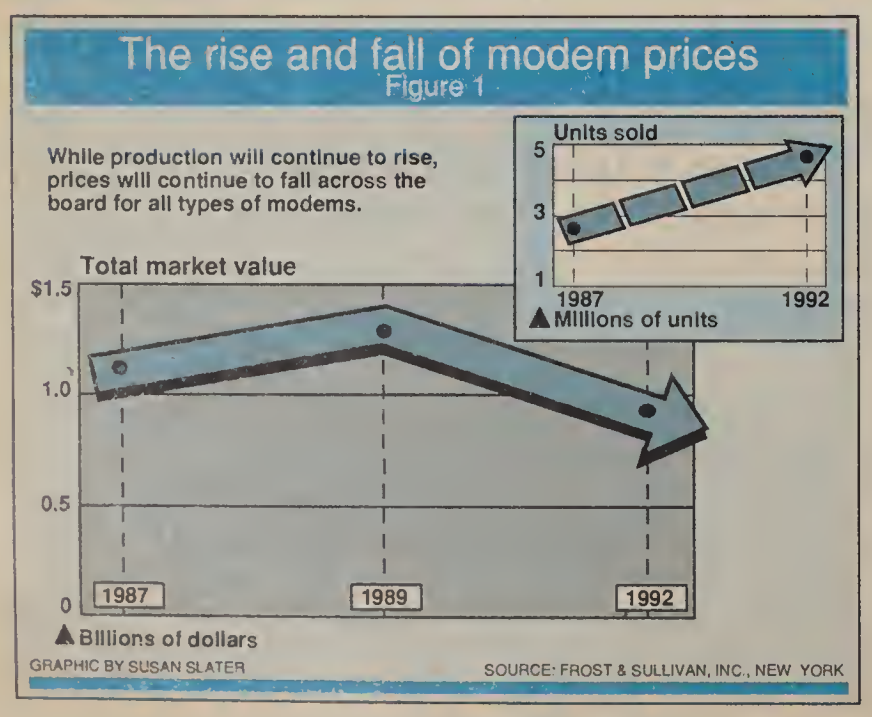
Not all users want to go faster, however. IDC's Gonze says that "9.6K bit/sec is still pretty fast and sophisticated for most users." And International Speedway's Hickman says he has no plans to go faster, at least not yet.

"Within the foreseeable future, we won't be moving to higher speeds," Hickman says. "When digital becomes available, we'll consider using it for the whole route; and at that time, we'll probably use these 14.4Ks for backup purposes."

So users wanting the latest model can park their old clunkers in the garage and keep them there until they're needed.

Or they can trade in old reliable — at a loss, most likely — for something with a bit more dash and flash. Either way, like cars, modems will not likely disappear in the foreseeable future.





Far from the madding crowd

continued from page 40

ferences, the quality of service, presence and image all validate our existence."

Fippinger says his challenge is to encourage Techmart's tenants to interact with one another and use the facility's resources.

"We don't pretend to know how to market their products," he says. "We provide convenience and support to make their marketing efforts more efficient."

Fippinger is also counting on communications events such as Sun Microsystems, Inc.'s Connectathon '89 to put Techmart on the map. The Connectathon conference, held earlier this month, featured microcomputer-to-mainframe connectivity and showcased systems from Sun, a major Techmart tenant.

Despite Techmart's experiences, Inforum and Techworld are counting on the growing enthusiasm for high-tech trade marts to pave the way for their own successes.

Techworld and Inforum

Techworld's success will stem from its captive audience of federal government and trade association users, according to Alan Bogatay, Techworld's senior vice-president for marketing. To capitalize on that user base, Techworld will sponsor events targeted at government agencies, he says. Xerox, Techworld's first renter, plans to move into the building in January 1990. Several other leases are under negotiation, says Bogatay, who hopes to attract some 100,000 people annually to Techworld.

Inforum, which will be a nine-story, 1.5-million-sq.-ft. facility when completed, hopes to position itself as a connectivity center for personal computer local networks, microcomputer-to-mainframe communications and telecommunications, says Inforum's Mauro. The Georgia Institute of Technology is helping to design a network that will allow any company's systems to hook up with any other company's in the building over fiber, coaxial cable or twisted-pair wire, he says.

Corporate briefing sessions will be a major facet of Inforum, which has signed its first tenants, BellSouth Corp., an Atlanta-based regional Bell holding company, and Canon U.S.A., Inc., a distribution center for the southeastern territory of the Lake Success, N.Y.-based computer and peripherals manufacturer.

The jury's still out on how effective high-tech trade marts are. Some vendors are using such locations as an effective tool in their marketing arsenal, while others are finding less success with the concept. Many observers believe it's just a matter of time and education before industry leaders recognize the value of the trade marts.

"The trend toward [high-tech trade marts] will continue to grow," McKee says. "It may have been correct to turn down an opportunity to be in a mart three years ago, but it's not today."

Letters

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The single-vendor route

While I think that *Network World* is definitely a notch above the other trade publications, I am writing to express an opinion on a matter I have never seen you address.

With so many vendors offering such a vast array of products, how can user companies determine which products are critical to their success? To limit the complexity of working with multiple vendors, users should pursue a single-vendor procurement strategy.

Maintaining technical competence with multiple vendors' products becomes very improbable. Imagine you or your staff becoming proficient in more than a few products. Mistakes and confusion often occur, for example, mixing capabilities of one vendor's product with another.

By concentrating their focus and selecting products from fewer vendors, users can benefit by working with other users with similar interests. They can also join users groups and committees. This facilitates the sharing of ideas; users can work as a group to solve common problems.

As a result of working with fewer vendors, users can maintain communication with the vendor, either through the marketing team or directly with the factory. This feedback allows the vendor to develop products and enhancements of products based on users' inputs and requirements.

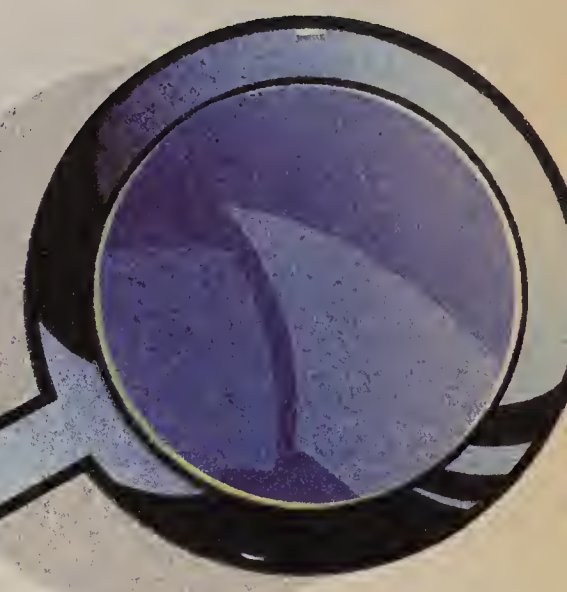
Another key benefit of a single-vendor procurement strategy is the single point of contact for support issues. If only one vendor's product is selected, one telephone call can be made when service issues arise. Troubleshooting and problem identification are performed much more easily, and the vendor takes full responsibility for fixing the problem. This virtually eliminates vendors blaming one another with respect to a service problem.

One drawback to this strategy might be that users may be limiting their ability to apply current technologies obtainable from other vendors. But a user can migrate to another vendor if the existing vendor does not meet the technical requirements.

In summary, the price of pursuing a single-vendor procurement strategy is minimal compared with the cost of managing multiple vendors' products.

David Orwick
Account systems engineer
IBM
Schaumburg, Ill.

The Best Value In Token Ring.



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ONE

Most Important/Most Useful Networking/Communications Publication

It began with the 1988 *Wall Street Journal* Telecommunications Study naming *Network World* the Most Important/Most Useful networking/communications trade publication among ICA members. *Network World* notched a 34 percentage point increase in its climb to the Most Important/Most Useful position, while every other networking/communications trade publication actually lost ICA member support — by as much as 9 percentage points.

Publication	Percentage-point Increase/Decrease
Network World	34%
TP+T	-1%
Data Communications	-1%
Telephony	-2%
Teleconnect	-3%
Telecommunications	-3%
Communications Week	-8%
Communications News	-9%

Source: *The Wall Street Journal* Telecommunications Study by Erdos and Morgan, March 1986 and March 1988.

TWO

Most Helpful Publication

Then the 1988 Telecommunications Association Member Study revealed *Network World* to be the Most Helpful publication for giving managers and users the kind of news and information they need every day.

Publication	Preference
Network World	30%
Communications Week	25%
Business Communications Review	20%
Communications News	15%
Data Communications	15%
Teleconnect	15%
Telecommunications	10%
Telephony	10%

Source: 1988 Telecommunications Association Member Study.

THREE

Largest Growth in Ad Pages

And the December 1988 TA Report showed *Network World* leading all other networking/communications publications in ad-page growth. In fact, *Network World's* growth for the comparative periods exceeded that of its nearest competitor by 63%!

Publication	Ad-Page Growth
Network World	64%
Data Communications	1%
Communications Week	-5%
TEM	-12%
Telephony	-20%
Telecommunications	-20%

Source: December 1988 TA Report. Comparative growth in advertising pages for the period from January-December 1988 versus January-December 1987.

Network World delivers your advertising message to an audience of over 70,000 ABC audited buyers — who each plan to spend an average of $2.5 million on networking/communications products and services in the next 12 months. So when you're planning your strategy for reaching buyers, go for a sweep — and turn to *Network World*. Call Paul McPherson, Director of Advertising, at (508) 820-2543 to reserve your space today!

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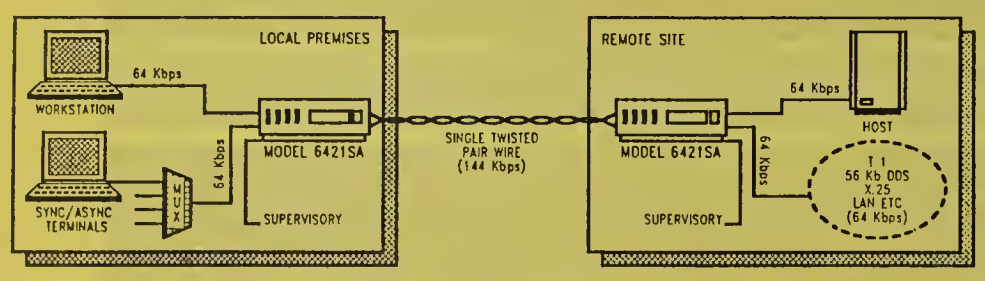

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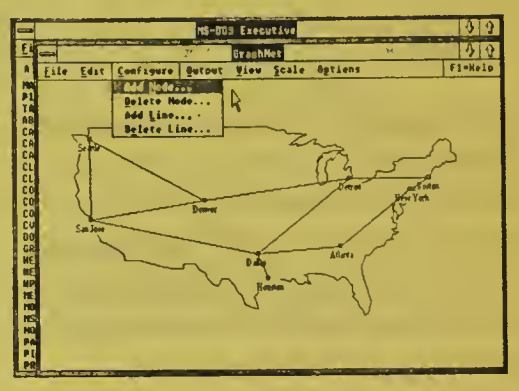

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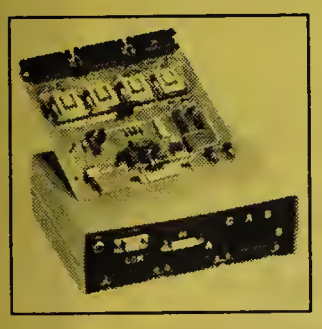

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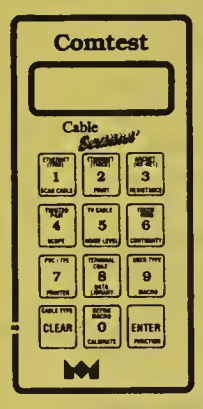

* Cable length measurements
* Locate breaks, shorts, opens, bad crimps, etc.
* LAN activity monitoring
* Find cables in ceilings, walls, floors
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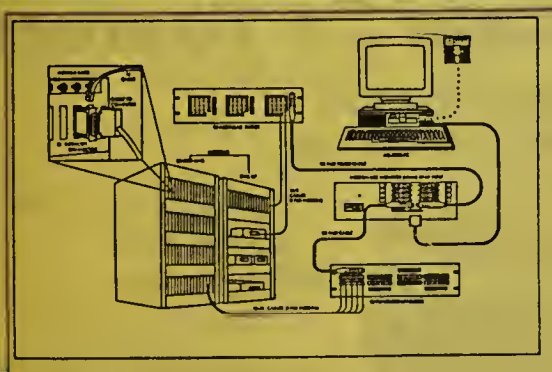

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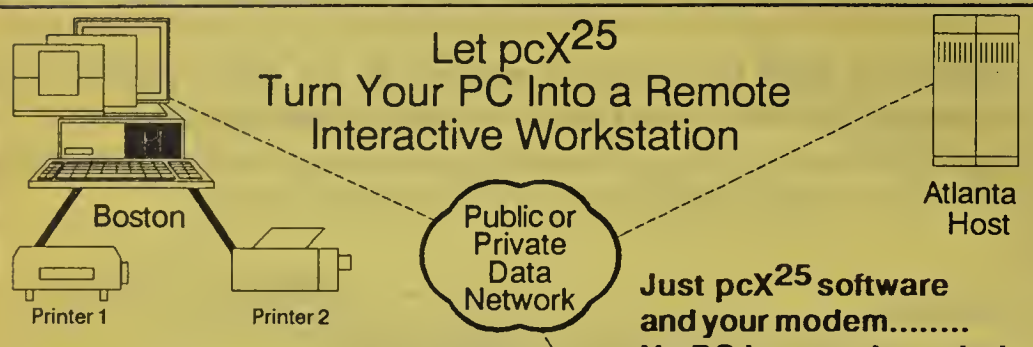

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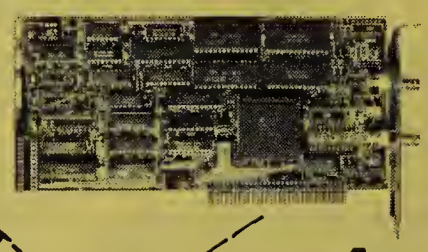

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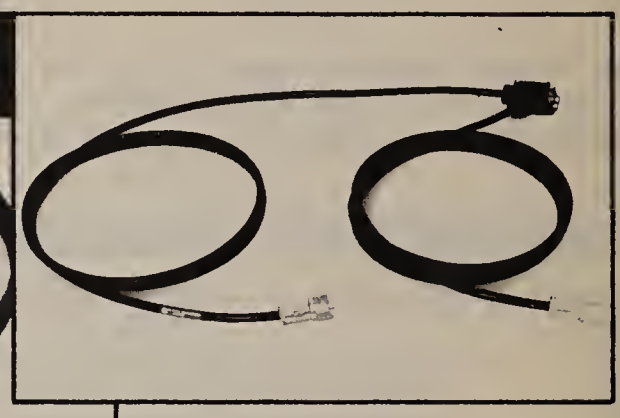

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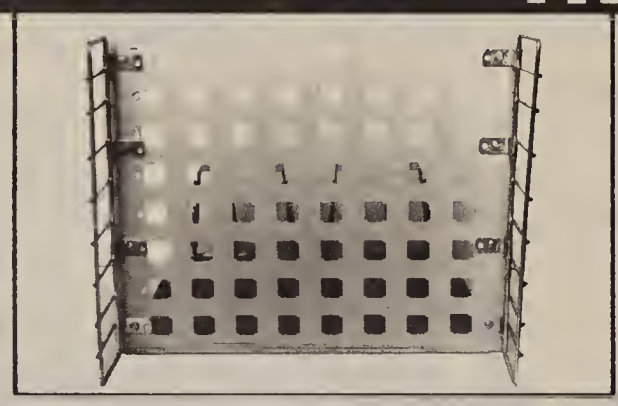

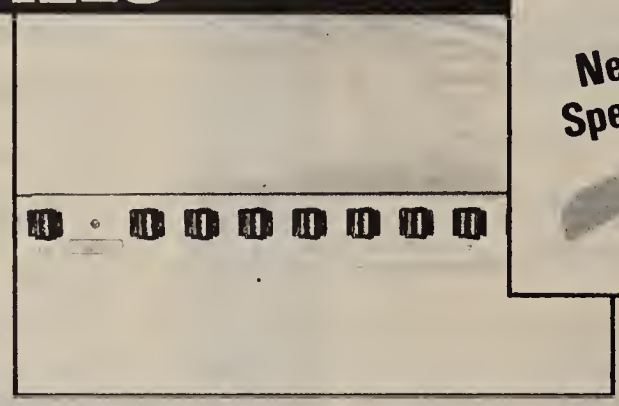

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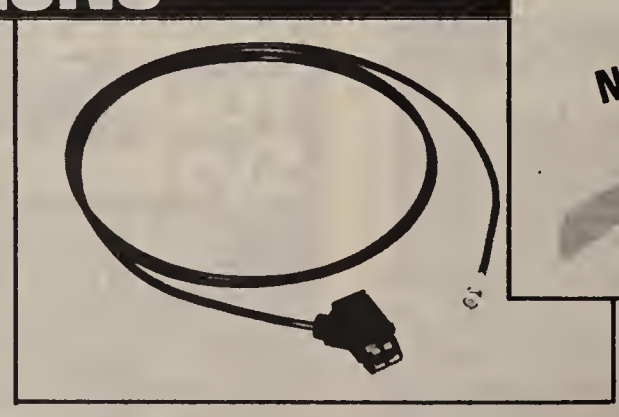

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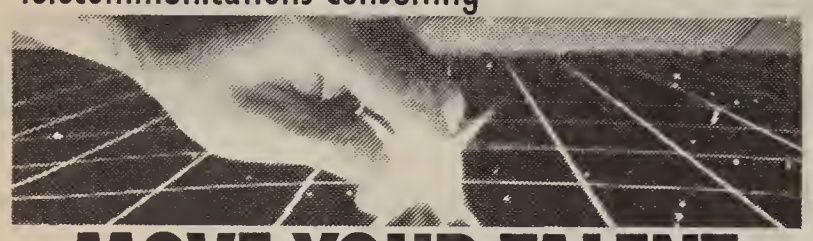

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A guide to taking risk out

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written a book to guide communications managers through the perils and pitfalls of making communications purchasing decisions.

In his 450-page *Minimum Risk Strategy for Acquiring Communications Equipment and Services*, Muller provides a 12-point checklist for discovering weaknesses in vendor organizations. The checklist covers research and development, application engineering, quality assurance, repair and return, customer service, line of business, technical documentation, customer training, quality of salespeople, references, escrow protection and human resources.

For each category, Muller provides questions a communications manager should ask a vendor before purchasing products. Armed with answers to these questions, managers can easily cut through vendor hype and discern the stability of vendors and the quality of support they will give their product lines in the future, according to Muller.

In addition to analyzing vendor organizations, Muller devotes nearly a dozen chapters to evaluating currently available network equipment. He covers everything from modems and mainframes to Integrated Services Digital Network products. In each area, he examines the products available and helps readers decide what features are appropriate for their applications at reasonable prices.

Also included are chapters on choosing consultants and buying through the mail.

Muller correctly states that communications managers are no longer judged solely on technical knowledge, but on business acumen and planning. Today's managers must be able to evaluate vendor organizations and make effective purchasing decisions. Without these skills, managers jeopardize their careers.

"When things go wrong and you are finally called on the carpet by top management for the bad purchase decision, the words 'I just assumed . . .' will fall on deaf ears," Muller says. "While you are making excuses, others are wondering why you did not do your homework. Why you did not ask the right questions. Why you did not think."

Muller's book is useful for helping communications managers avoid this nightmare.

FCC defends price caps

continued from page 13

tive residential services.

Patrick also told Congress he will include an "automatic stabilizer" in the price cap plan for local carriers. This would provide for automatic adjustments to the prices local carriers charge if they exceed a predetermined profit level.

Because the stabilizer is a major change from the original proposal, Patrick said he recommends further study for local carriers while proceeding with price caps for AT&T.

July 1 target

Patrick said in his letter that he will suggest moving the implementation date of price caps for AT&T from April 1 to July 1.

Although Patrick agreed to modifications in some areas, he held firm on some of the more controversial aspects of the price cap plan. For example, Patrick continued to insist that price caps are appropriate for both AT&T and local exchange carriers.

Opponents have argued that price caps are only appropriate for AT&T in the long-distance market, which is subject to competition, but not the local exchange market because local carriers still maintain virtual monopolies there.

Patrick said that arguments against implementing price caps for the local carriers were "unsupported in theory or by fact" in the FCC's record. Further, he said, such arguments were at odds with evidence of successful implementation of price caps for local carriers in the UK.

Mandatory implementation

One change affecting local exchange carriers that Patrick said he would support is mandatory implementation for larger local carriers. Previously, all local carriers had the option not to choose price caps.

Patrick also held firm on the use of a 3% productivity factor for the carriers. According to the price cap plan, the productivity factor will be used to determine how much ratepayers save each year under price caps.

Future rate increases will be held to 3% (or whatever productivity factor is eventually approved) below the gross national product, which measures the productivity of the nation as a whole.

Patrick indicated he still strongly supports using current rates for the caps. Critics have argued that caps should be reduced below current levels to compensate for carrier inefficiencies.

These inefficiencies, the critics say, have caused inflated prices under current rate-of-return regulation. The suggestion to base caps on current rates is also drawing criticism because some of those prices are under investigation and have yet to be proven lawful.

Patrick downplayed such concerns. "Nothing in the price cap plan prevents the commission from ordering adjustments, including refunds, in the event that a rate subject to investigation is found to be unlawful after the initiation of price cap regulation," he said.

Competitive carriers echo MCI on tariffs, price caps

Conference speakers fear advantages for AT&T.

By Anita Taff
Washington Bureau Chief

SAN ANTONIO, Texas — Although MCI Communications Corp. has been one of the most vocal opponents of price caps and AT&T's single-customer tariffs, concern about these issues runs deep among alternative carriers as well, said attendees at last week's Competitive Telecommunications Association meeting here.

A common theme among speakers at the conference was that the current regulatory policies of the Federal Communications Commission could jeopardize long-haul competition. Price caps and customized tariffs such as Tariffs 12, 15 and 16 could give AT&T so much pricing flexibility that it could undercut competitors and drive them out of the market, they said.

In his opening address, former FCC chairman Richard Wiley was applauded as he criticized the regulatory agency's policies regarding AT&T.

Wiley, a partner in Wiley, Rein & Fielding, a Washington, D.C. law firm that handles communications matters, acknowledged that a case might be made for giving AT&T more flexibility in the marketplace. "But I would contend that the current process of deregulating AT&T is not fair, orderly or even legal," Wiley said.

"AT&T has engaged in a systematic use of the commission's tariff process to achieve what some observers are calling self-deregulation. If this process continues, what we may witness in the future is not a thousand points of light, but a thousand customized tariffs," Wiley said.

By letting the carrier's proposed tariffs take effect pending investigation, the FCC has done little to stop AT&T from self-deregulation, he said. The investigation of AT&T's Tariff 12 offering for General Electric Co. has been pending since 1987.

Considerable peril

That inaction has created "considerable peril" for competitive carriers, Wiley said. AT&T has been able to lock in most of the federal government and three of the 10 largest companies in the U.S. through specialized tariffs.

"Indeed, the total annual revenues of AT&T's Tariff 12 customers alone, not including [Federal Telecommunications System] 2000, which is the largest telecommunications procurement ever, is equal to the gross national product of Australia, Spain or India," Wiley said.

Other speakers warned that price caps could be damaging to alternative carriers because they would give AT&T too much pricing flexibility and could allow the regional Bell holding companies to raise access rates, which make up about 50% of the cost of long-distance services.

"[The price cap plan] is a prescription for annual rate increases and rate structure manipulation," said Sanford Fain, director of governmental affairs for ALC Communications. Fain said he is not opposed to the concept of incentive-based regulation but he is convinced that the FCC's proposal is flawed.

The current plan to cap rates according to three categories of services — one for 800 services, one for residential services and one for business services — will not prevent cross-subsidization and predatory pricing, Fain said.

After the first year of price caps, prices will be adjusted for inflation. At that time, AT&T could raise rates only in the categories in which it has little competition. Rates would stay the same for services facing intense competition, he said.

On an overall basis, the rate increases from some categories will be used to offset losses from a price freeze in other categories, Fain said.

Fact or fiction?

Eugene Kimmelman, legislative director of the Consumer Federation of America, strongly opposed the FCC's price cap plan. "If there was ever anything that made rate-of-return [regulation] look good, this is it," he said.

Kimmelman complained that the price cap plan formulated by the FCC is based on assumptions rather than facts.

"A rational approach to the price cap concept would tie flexibility in regulation to the actual competition in the market with benchmarks, data and real analysis," he said.

However, Thomas Barry, vice-president of revenue and public affairs at Southwestern Bell Corp., said rate-of-return regulation severely hampers the introduction of new services for end users and carriers. Currently, the local carriers are penalized whether a new service is a success or a failure, he said.

Illinois Bell lands $32.5m pact for Chicago citywide Centrex net

By Bob Wallace
Senior Editor

CHICAGO — The city of Chicago last week awarded Illinois Bell Telephone and Telegraph Co. a 10-year, $32.5 million contract for a 14,300-line digital Centrex network serving 481 locations in the city.

As part of the project, Illinois Bell will install two Northern Telecom, Inc. DMS-100 central office switches in its switching centers here and seven remote switching units interconnected with fiber-optic cable. This switching equipment will be dedicated to serving the city's telecommunications needs.

Chicago officials estimate the citywide Centrex network, dubbed Citynet, will reduce telecommunications costs by $15 million in the decade following cutover of the network, which is scheduled for late 1992. The city is expected to save an additional $500,000 a year by being able to more easily administer station moves, adds and changes.

The Centrex network will give the city a uniform, five-digit dialing plan and allow city employees to transfer calls between departments for the first time. The city currently uses 7,000 lines of analog Centrex and 6,000 regular access lines.

"We only have half a network right now," said Douglas Power, telecommunications manager for Chicago.

The project also calls for the replacement of inside wiring in all network sites. Illinois Bell will run two four-pair, twisted-pair wires to every jack in each of the nearly 500 sites.

No need for ISDN

The city did not contract for Integrated Services Digital Network Basic Rate Interface lines but stipulated in the contract that competitive pricing be offered if it chooses to use the new services. "The city doesn't have any need for ISDN right now," Power said.

As part of the contract, Ameritech Information Systems, the Ameritech equipment sales arm, will supply and install 2,100 multiline telephone sets and 12,000 single-line telephone sets made by Northern Telecom.

Illinois Bell will design and construct a 2,000-sq.-ft. network control center located on the customer's premises. The city's communications staff will be able to track Centrex use and charges, and modify the service to control costs or to adapt to changes in calling patterns.

The center will house a mainframe-based telemanagement system that will enable the city to create a service and equipment inventory as well as track orders, problems, cabling and billing.

The net control center will be equipped with a Wang Laboratories, Inc. VS minicomputer-based electronic mail system

IBM charts net management course

continued from page 1

gence tools such as expert systems and high-level programming languages that will simplify automation of routine net control functions and ease the management of complex networks.

Artificial intelligence systems will free NetView users from making decisions on the continual stream of alerts that filter up to a network management operator's console. The systems will evaluate the alerts and take corrective measures in real time to remedy the faults or suggest a plan of action to the operator.

Shaughnessy said IBM also plans to route Open Systems Interconnection network control data directly to NetView, bypassing NetView/PC. OSI Common Management Information Protocol alerts will be encapsulated in Systems Network Architecture protocols for presentation to NetView. OSI net control data will appear along with SNA alerts on the same NetView console.

IBM will support Transmission Control Protocol/Internet Protocol net management data in a similar way, but Shaughnessy declined to detail that plan.

Users and analysts applauded IBM's efforts to widen NetView's control of OSI and TCP/IP nets as well as its plan for increased automation. But they cited other areas that demand immediate attention,

Hooked on NetView/PC

- Applied Systems Technologies, Inc.
- Bytex Corp.
- Digital Communications Associates, Inc.
- Dynatech Communications, Inc.
- General DataComm, Inc.
- McDonnell Douglas Network Systems Co.
- Network Equipment Technologies, Inc.
- Newbridge Networks, Inc.
- Paradyne Corp.
- Racal-Milgo
- Racal-Vadic
- StrataCom, Inc.
- TelWatch, Inc.
- Timeplex, Inc.
- TSB International, Inc.
- Ungermann-Bass, Inc.

This is a partial list of vendors that plan to develop links between their products and IBM's OS/2-based version of NetView/PC.

SOURCE: IBM, RALEIGH, N.C.

that will serve 1,000 end users and a VMX, Inc. 5000 stand-alone voice mail system that will serve 1,000 additional workers.

Workers in city agencies will also be able to access three IBM mainframes in the city's MIS center using some 200 switched 56K bit/sec data lines.

Beat out AT&T, GTE

Illinois Bell underbid AT&T and GTE Corp. to win the lucrative contract, Power said. "Illinois Bell did the best job with its proposal," he said. "Their technical response was strong, and their prices were great, although their project management response was only so-so." The project management portion of the contract includes ongoing maintenance and support, and the training of 12,000 city employees to use the new equipment.

In its bid, AT&T offered a 5ESS digital central office switch that could be located at the customer site or in its closest central office. GTE also pushed a central office switch that it wanted to locate in its closest central office.

Chicago started the 27-month network acquisition process when it issued a request for information and qualifications in late 1986. The actual request for proposal was issued in October 1987, and responses were received two months after that.

including a better user interface and a repository for net control data.

Continuing to enhance what many analysts believe is NetView's strong point — automation — IBM is providing support for REXX with NetView Release 3, which is due out in May for MVS/XA and in August for VM. REXX is a procedural language that makes it easier for programmers to write command lists, which are strings of commands invoked by a single key or command, Shaughnessy said.

Additionally, he said NetView Release 3 will support the high-level programming languages C and PL/1. The latter is used with the IBM Knowledge Tool, which is used to build expert systems. Expert systems are rule-based programs that automate responses to network alerts.

NetView users lauded the move to automation. "Automation is one of the primary uses we [make] of NetView," said Doug Weber, district manager of the information systems department at Southwestern Bell Telephone Co. in St. Louis.

However, expert systems require a data base that can store information on network events. IBM envisions providing a relational data base management system that will be both a high-speed tool for gathering network information and a repository for configuration data and other more static information, Shaughnessy said. He declined to say whether IBM plans to incorporate both within a single DBMS and when it will be available.

NetView/PC

IBM defended NetView/PC as the most cost-effective method for bringing non-SNA devices under NetView's control. IBM's Smith conceded that application developers had experienced problems taking advantage of NetView/PC's control capabilities using the first two versions of the product, which were subject to the 640K-byte memory constraint imposed by PC-DOS.

But that has changed with the 16M bytes of memory available with Release 1.2 running on a Personal System/2 under OS/2 Extended Edition, Smith said. He predicted that vendors will use the expanded memory to implement commands that allow for control of non-SNA devices from NetView.

He added that it will now be possible to support eight to 12 net management products from a single Personal System/2 running NetView/PC.

Skeptics remain

Even under OS/2, many analysts and users questioned the NetView/PC strategy because it relies on third parties.

"What we've found is that IBM's implementation is good; however, the other vendor involved doesn't understand the nuances, features and functionality of NetView," Weber said.

Smith acknowledged he is disappointed in the quality of some applications but said he expects vendors will slowly implement more command functions.

Some analysts are not as sure as Smith. "It's not clear to people that they get a whole lot out of compatibility with NetView/PC," said James Herman, a principal with the Boston consultancy Northeast Consulting Resources, Inc. "I think the world is moving very rapidly to OSI for network management interoperability."

Agree on graphics

One point analysts, users and IBM all agreed on was the need for a graphics-based user interface to NetView.

"You need a modern, icon-driven interface for issuing commands instead of memorizing arcane alphanumeric sequences," said Greg Lee, a NetView user and manager of the network division of Chevron Information Technology Co. in San Ramone, Calif. The easy-to-understand interface is especially important during shifts when technician-level operators control the network, Lee said.

"You can't get master degree computer scientists to work the graveyard [shift] on Christmas," he said.

IBM's Shaughnessy said a graphics interface is planned for NetView, but he declined to say when it will be available.

Switched 56 alters rules of game

continued from page 1

savings, vendors and analysts say the services will stimulate the acceptance of emerging high-bandwidth applications, such as video-teleconferencing and CCITT Group IV facsimile.

AT&T's competitors say their dial-up 56K bit/sec services are priced 78% to 88% lower than AT&T's current Accunet Switched 56 prices, which range from 35 cents to $1.08 per minute on average, depending on circuit length. Under optional discount rates, AT&T's price drops from 81 cents to 26 cents per minute.

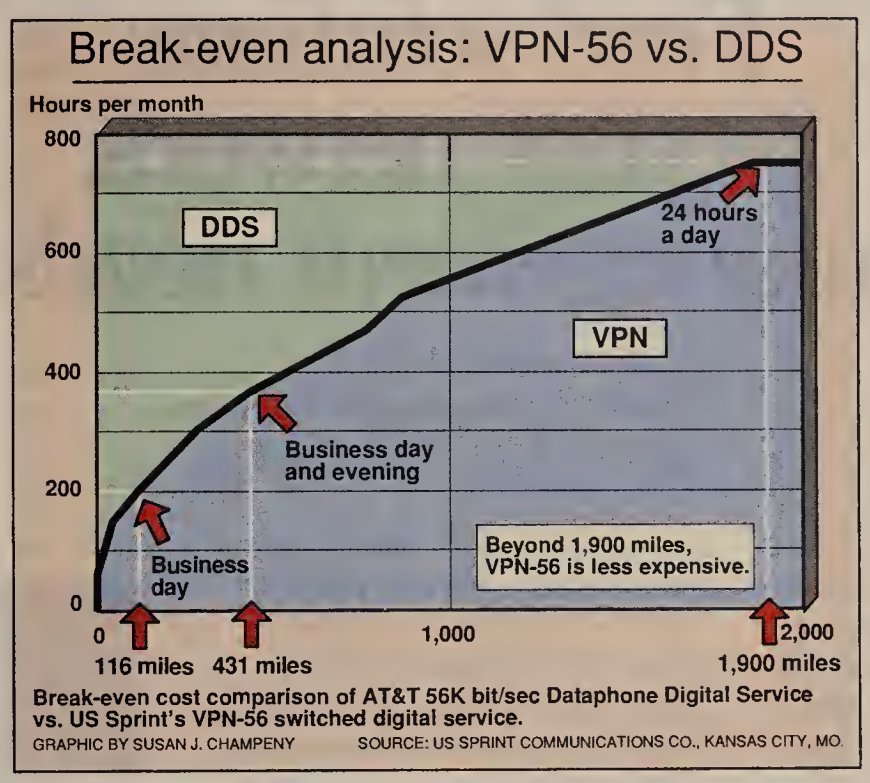
US Sprint's Virtual Private Network-56 (VPN-56) costs 8 to 13 cents per minute, and MCI, which has not yet finalized its pricing, said the range for its 56 Kilobit Switched Digital Service will be 10 to 20 cents per minute.

"Look at the prices," said Mark Sitko, product manager for MCI's 56 Kilobit Switched Digital Service. "They are essentially voice prices being applied to data services."

Leased alternative

The low-priced services will encourage users to reevaluate use of dedicated 56K bit/sec digital data service circuits.

US Sprint compares its VPN-56 with AT&T's DDS in terms of monthly hours of use and circuit distance, according to John Haines, director of industry marketing for US Sprint (see graphic, this page).



Break-even cost comparison of AT&T 56K bit/sec Dataphone Digital Service vs. US Sprint's VPN-56 switched digital service.

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: US SPRINT COMMUNICATIONS CO., KANSAS CITY, MO.

Assuming the service is used nine hours a day for 23 business days per month, all VPN-56 circuits longer than 116 miles will be less expensive than AT&T's DDS, according to US Sprint.

If circuit usage extends into the evening hours, VPN-56 is less expensive than AT&T's DDS for circuits longer than 431 miles. For 56K bit/sec AT&T DDS circuits used around-the-clock, VPN-56 is only less expensive for circuits longer than 1,900 miles.

While less costly, the dial-up services do not have AT&T's DDS service track record. AT&T's DDS is designed to average 99.5% errorfree seconds for 56K bit/sec transmissions and to furnish errorfree performance 99% of the time.

Although not guaranteed, Haines said US Sprint's VPN-56 will support 99.8% errorfree seconds at that speed, and MCI's Sitko said his company's service will support 99.79% errorfree seconds.

Besides offering potential cost savings, customers are expected to adopt the low-cost services to speed up existing applications, such as backing up data, one of the top concerns of prospective MCI customers, Sitko said.

At 56K bit/sec, the new services will also speed up applications such as electronic mail. "At 56K, you scan pages, not lines," Haines said.

But the low prices are also expected to spark demand for new technologies.

Customers, for example, will be able to support acceptable-quality color video teleconferencing over two dial-up 56K bit/sec links for about $12 per hour, Haines said. This compares with about $300 per hour for US Sprint's high-end video service.

Use of high-speed Group IV facsimile is also expected to take off, Haines said. Group IV facsimile machines can crank out a Xerox-quality page in six seconds, vs. 30 seconds for lower quality Group III devices.

In the long term, low-cost switched 56K bit/sec service could change the way companies build networks.

FCC price cap plan gets boost

continued from page 3

tance rates down. They would free AT&T from having to file cumbersome and time-consuming tariffs and give it more flexibility in pricing its services.

But the study said implementation of price caps for AT&T is not a critical issue. The long-distance carrier currently faces stiff competition that has been forcing it to trim costs and operate more efficiently.

"For AT&T, price caps can best be regarded as a transitional regulatory tool on the road to full deregulation," according to the study.

Johnson said price caps are more important for regulating monopoly local exchange carriers because they reduce the threat of "predatory behavior."

He acknowledged that, even under price caps, phone companies could still cross-subsidize new ventures, but to a lesser degree. To avoid this, phone services should be grouped into two or more service "baskets," or categories, depending on the degree of competition the services face in the marketplace, Johnson said.

For example, basic phone service would be assigned to a monopoly service basket, while services that face competition from unregulated businesses, such as central office-based local networks, would be placed in another basket. Some services, Johnson said, might be completely deregulated.

Currently, the FCC has proposed two service baskets, one for switched and the other for nonswitched services.

Price cap critics, especially consumer groups such as the Consumer Federation of America, have said the FCC's formula for determining changes in rate ceilings could cost consumers billions in higher rates ("Patrick shelves price cap vote at Congress' request," *NW,* Feb. 6). Currently, the FCC is proposing to restrict increases in rate ceilings to 3% less than the gross national product index.

Johnson minimizes the importance of the productivity factor, which measures the increased operating efficiencies carriers gain through advances in telecommunications technology.

Consumers will eventually benefit from price caps regardless of the level at which the productivity factor is initially set, Johnson said. With price caps, carriers will lower costs and operate more efficiently in order to increase profits. That will result in reduced rates and spur the introduction of new services.

As evidence of the study's claims, Johnson cited the UK's experiences with price caps. Since its divestiture in 1984, British Telecommunications plc has been regulated under a price cap plan. The British government set the productivity formula at 3% in 1984 and increased it to 4.5% in 1988.

> "If phone companies don't constantly improve their nets, they risk losing market share."
>
> ▲▲▲

The sky won't fall in

"People realized the sky didn't fall in because the original formula was too low. Users, consumer groups and carriers are generally pleased with price caps and wouldn't consider converting to rate-of-return regulation," Johnson said.

He said telephone rates have risen less than inflation under the plan and some prices have fallen.

Critics of the plan also insist that the quality of phone service would decline under price caps. Carriers would be more interested in maximizing profits and slashing costs than in making costly upgrades to the phone network, they say.

But the study stated there is no reason to believe service would decline. According to Johnson, carriers that let their networks decline would jeopardize new service ventures.

"Both monopoly and competitive services share many of the same [facilities]," he said. "If phone companies don't constantly improve their networks, they risk losing market share for competitive services."

HP, 3Com team in effort

continued from page 1

thus ensuring that customers investing in LAN Manager will be able to migrate upward.

"By providing scalable servers, we'll allow our users to start with a 3Com 3S/400 Intel 80386-based server and migrate to HP's larger minicomputer servers as their networks grow," said William Krause, 3Com's chairman and chief executive officer.

HP will also benefit by saving the cost of developing an OS/2 version of LAN Manager to support personal computer users. HP will market a version of 3Com's 3+Open LAN Manager as the HP 3+Open LAN Manager.

"3Com gives HP a broader scope in the PC LAN client/server market," said Douglas Chance, HP executive vice-president for its Networked Systems Sector.

HP's endorsement of the 3+Open LAN Manager does not pose a conflict in selling HP's Unix version of the OS/2 LAN Manager, called LAN Manager/X, because the two appeal to different users, Chance said. 3Com, however, does not plan to serve as an OEM for HP's LAN Manager/X, according to Krause.

Broader scope

3Com and HP will cooperate on development of a common TCP/IP product line for their OS/2 LAN Manager offerings, jointly develop E-mail offerings and codevelop LAN Manager network management software that will run under HP's OpenView architecture.

The products will enable users to print and share files, and access data bases maintained on a variety of operating systems, including OS/2, HP's MPE/XL and Unix, Chance said.

The effort to standardize on a common TCP/IP protocol stack will let HP's LAN Manager/X users exchange data with users on 3+Open networks. It will also enable users on MS-DOS, OS/2 and Unix workstations to communicate with other computers that support TCP/IP.

The companies also committed to codevelop common X.400 E-mail systems. This will enable users of 3+Open and 3+Mail, 3Com's DOS-based mail system, to send messages directly to users on remote HP mail systems.

Additionally, 3Com will work with HP to develop the next phase of HP's OpenView, which is a network management system based on TCP/IP and Open Systems Interconnection standards. "Network administrators won't have to learn separate user interfaces; they'll be able to manage their multivendor networks using similar net management interfaces," a 3Com spokeswoman said.

Service and support

Under the maintenance part of the alliance, HP will provide service and support for 3Com's work group products through its Worldwide Customer Support Operation.

"Users are installing networks worldwide, and 3Com doesn't have enough people to service these networks. The HP alliance allows us to put together a much broader service and support program than we would have been able to do alone," Krause said.

George Colony, president of Cambridge, Mass., consulting firm Forrester Research, Inc., agreed. "HP's service and support will provide 3Com with a critical and competitive advantage," he said.

Westinghouse mulls Tariff 12 bid

continued from page 1

The company currently uses services from the three carriers, including T-1 lines from AT&T and virtual network service from MCI and US Sprint. AT&T stands to lose the most in the winner-take-all contract, Edison said.

"Long-distance rates are dropping about 4% a year, but I want to do better than that and go below tariffed rates," he said. "I should be able to get a better rate, given Westinghouse's purchasing power."

Under Tariff 12, AT&T builds, operates and manages custom networks, supplying switched and private-line services as well as network equipment. If AT&T wins the contract, Westinghouse will become the seventh Tariff 12 user and the first Tariff 12 user to be signed on in 1989.

AT&T has used Tariff 12 to lock in some of its biggest customers (see graphic, this page). Joseph Nacchio, vice-president of business services in AT&T's Business Markets Group, said recently that AT&T may file as many as 200 Tariff 12 custom network deals this year ("Top AT&T executive talks tough," *NW*, Jan. 23).

Several of AT&T's earlier Tariff 12 filings have been protested by its rivals and are currently under investigation by the Federal Communications Commission.

Floodgates are open

Analysts said the industry will soon be awash with Tariff 12 proposals. "The floodgates are open. You are going to see Tariff 12 proposals landing on the desks of medium-sized and large customers whether they're solicited or not," said Berge Ayvazian, research and consulting vice-president for The Yankee Group, a Boston-based research and consulting firm.

After receiving AT&T's Tariff 12 proposal, Edison said, "We decided not to deal exclusively with one carrier. We gave [data on] our network to MCI and US Sprint and asked them to bid."

The winning supplier will assume control and management of the new network. Westinghouse's staff will monitor the carrier's billing system, verify and maintain traffic data, administer quality assurance programs and monitor network performance.

Tariff 12 users

	Filing date
U.S. Department of Defense	July 1985
General Electric Co.	March 1987
E.I. Du Pont de Nemours & Co.	September 1987
Ford Motor Co.	February 1988
American Express Co.	September 1988
American Airlines, Inc.	November 1988

GRAPHIC BY SUSAN J CHAMPENY

Billing is a sensitive issue at Westinghouse. "We have had serious billing problems with all three carriers. We will not tolerate further problems in this area," Edison said.

Service quality is also a concern. "There's a lot of attention focused on this area during the bid evaluation process, but then carriers go on to the next customer. We don't want [the winning carrier] to lose sight of the fact that [maintaining] service quality is an ongoing effort," he said.

Westinghouse has made several major changes to its voice network in the past six years, according to Edison.

In 1982, the company began using AT&T's Enhanced Private-Switched Communications Service (EPSCS) — which was designed to provide savings for large users by combining their traffic over switches dedicated to service users. Westinghouse later migrated to an upgraded EPSCS service.

A few years later, Westinghouse began replacing EPSCS service with less expensive T-1 lines to interconnect its largest sites. The T-1 lines were also used to support an AT&T Electronic Tandem Network (ETN). In an ETN, intelligent PBXs at user sites handle routing, management and control functions.

Westinghouse's network metamorphosis continued as the firm began migrating to virtual net services. These services allow large businesses to set up what appears to be a private net but that utilizes switched facilities.

Westinghouse has migrated sites on its private network to MCI's Virtual Network service and US Sprint's Virtual Private Network service.

The company plans to eventually sell the System 85s currently used in its ETN, but it will likely keep multiplexers and packet-switching equipment collocated with the PBXs in ETN nodes.

Edison said evaluating the three carriers' proposals has been a long and arduous process. "A year has elapsed since we started this project. It's been a marathon for us and for the three carriers," he said.

"One thing I'm sad about is that there has to be winners and losers in this process. We have super relationships with our carriers," Edison said. "It's a shame two of them will lose."

Microsoft builds turbocharger

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The turbocharger will include a 32-bit implementation of the new file system in OS/2 Version 1.2, which is also scheduled to be released later this year.

The new file system can coexist with existing file systems on an OS/2 hard disk. According to Microsoft, benchmarks have shown that OS/2 Version 1.2 with the new file system could perform protected-mode data base sorts more than twice as fast as OS/2 Version 1.1.

Canadian National Railways, an early LAN Manager user, last week said it plans to phase out current Novell, Inc. NetWare and Banyan Systems, Inc. VINES networks and use only LAN Manager.

Canadian National, with local nets linking 5,000 users, is convinced that Microsoft's OS/2 LAN Manager is the local networking standard of the future.

"We've been beta-testing a number of OS/2 applications, and we are very impressed," said Ronan McGrath, vice-president of accounting at the railroad. "It's clear that the major developers are behind it."

McGrath, who spoke here at Microsoft's annual Systems Software Seminar, said Canadian National will standardize on LAN Manager products.

"We want to play it safe and stay as close to Microsoft's general system code as possible," he said. Currently, the railroad runs 3Com Corp.'s 3+Open version of Microsoft's LAN Manager.

Canadian National wants to develop a mainframe financial information system, based on IBM's DB2 data base software, with some of the processing distributed across a local network to OS/2-based servers and workstations. Microsoft's OS/2 Presentation Manager complies with IBM's Common User Access interface as specified in IBM's Systems Application Architecture.

By using Presentation Manager, the railroad will be able to provide a common user interface to its personal computers and 6,000 mainframe terminals.

ISDN lets travelers book rooms

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about such things as restaurants and entertainers appearing at the hotel.

If the traveler chooses to book a room, a full-motion video image of the reservation agent appears on the larger video screen. Video traffic is routed through an AT&T Vivid video switch in the Nevada Bell central office over the 45M bit/sec fiber line.

A camera in the kiosk captures live video of the customer. The reservation agent can move the camera from his computer terminal by issuing commands that are carried over one of the ISDN Basic Rate lines to an AT&T ISDN terminal connected to a camera pan/tilt controller.

The reservation agent negotiates rates with the traveler while displaying photos of available rooms on a screen. About 200 of these images are stored on an AT&T workstation at the kiosk.

The agent calls them up by issuing commands that are carried on a second Basic Rate line to another AT&T ISDN terminal attached to the workstation. This line also carries voice traffic between the traveler and reservation agent.

If travelers wish to book a room, they insert a credit card into a card reader at the center. The name and credit card number of the traveler are carried to the computer terminal of the reservation agent over the second Basic Rate Interface line.

The agent then keys this information into a credit-verification system. If accepted, the agent sends a confirmation number back to the traveler, and that number is printed on a receipt at the kiosk.

Say cheese

At the end of the transaction, the reservation agent asks the traveler if he would mind having his picture taken. If the traveler consents, an image is captured and sent over the video line to the AT&T video switch.

From there, it is transmitted to an AT&T 5ESS switch, which then sends the image over a third Basic Rate Interface line to the hotel front desk.

Other Reno hotels currently communicate with travelers in the airport through telephones in a travel information center about 40 feet away from the Harrah's kiosk.

But, according to Rick Chandler, product manager for new services at Nevada Bell, other hotels are interested in using ISDN to build similar kiosks.

"This is obviously something the others will do just to catch up to us," Miller said. "In the process, we'll keep on improving what we already have."

Among other improvements, Miller said the hotel is considering letting travelers bet on horse races, basketball games and other sporting events from the kiosk. The voice and data supporting these services would be carried over one of the ISDN lines, Chandler said.

The hotel will decide whether to continue the service after a 90-day trial that ends in May. Chandler said the hotel will pay approximately $1,000 per month for ISDN and video transmission services.

Chandler said that Nevada Bell and the hotel eventually want to run video traffic on the same ISDN lines that support voice and data.

But he said the hotel is waiting for the quality of 56K bit/sec video-compression technology to improve.

CeBIT to host OSI net demo

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munications among four areas of a simulated commercial enterprise: headquarters and administration, supplier operations, distribution and retail operations. The four groups will be connected with a simulated banking operation.

Information will be transmitted over an X.400 network using OSI File Transfer, Access and Management software and the Electronic Document Interchange for Administration, Commerce and Transport (EDIFACT) EDI standards sponsored by the United Nations EDIFACT group.

ISDN users meet

Also scheduled during CeBIT is a two-day international Integrated Services Digital Networks users' conference, to be held March 13 and 14. Officials from the West German federal government, local officials, representatives from the European Economic Community and ISDN users are scheduled to speak.

Users include representatives from Volkswagen-AG of Wolfsburg, West Germany; the Commerzbank AG of Frankfurt, West Germany; and McDonald's Corp. of Oak Brook, Ill.

Technical and administrative seminars on the benefits of ISDN will also be held.

NetWorld Europe 89

In conjunction with CeBIT, Novell will be hosting the first NetWorld Europe 89. Similar in scope to NetWorld events held in the U.S., this show will take place within CeBIT and will occupy 12,500 square feet of exhibit space. About 30 U.S. and European vendors will be offering NetWare-compatible software and hardware. A NetWare net will tie Novell's main booth with each of the 30 other exhibit spaces.

CeBIT attendance is useful for U.S.-based users, according to past attendees and vendors.

Calendar

March 6-9, Washington, D.C. — FOSE 89, The Federal Information Systems Conference & Exposition. Contact: National Trade Productions, 313 South Patrick St., Alexandria, Va. 22314; (800) 638-8510.

March 11-13, Dallas — Gaining a Competitive Edge Through Office Systems. Contact: Office Systems Research Association, 501 Grise Hall, Western Kentucky University, Bowling Green, Ky. 42101.

March 13-14, Philadelphia — Data Communications: A Thorough Update and Review. Contact: Network Career Advancement Institute, 202 Fashion Lane, Suite 113, Tustin, Calif., 92680; (714) 838-5458.

March 13-14, Detroit — Principles of EDI. Contact: Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138; (216) 243-6900.

March 13-16, New York — Interface 89 Plus. Contact: The Interface Group, 300 First Ave., Needham, Mass. 02194; (617) 449-6600.

March 14-15, Chicago — Broadband Technology: "It's not Just for Breakfast Anymore." Contact: InfoLan 89, P.O. Box 162323, Austin, Texas 78716; (800) 526-7469.

March 14-16, San Francisco — CASE: A Manager's Guide. Contact: Technology Transfer Institute, 741 10th St. , Santa Monica, Calif. 90402; (213) 394-8305.

March 15-16, St. Louis — Managing & Troubleshooting Data Communication. Contact: Washington University, Center for the Study of Data Processing, St. Louis, Mo. 63130; (314) 889-5149.

March 16-17, Boston — IBM's Systems Application Architecture. Contact: Gen2 Ventures, 12930 Saratoga Ave., Suite D-5, Saratoga, Calif. 95070; (408) 446-2277.

March 16-18, Los Angeles — Customer Satisfaction in the Telecommunications Industry. Contact: University of Southern California, Continuing Studies Registration, Los Angeles, Calif. 90089.

Voice message group opts for digital

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AMIS hopes to have a digital network protocol established as early as this summer, according to Bob Mercer, senior vice-president at Hatfield Associates, Inc., a consulting group based here that handles administrative tasks for AMIS. When the group formed last year, its goal was to set a specification within a year, he said.

King said that even though he voted against developing an all-digital specification, he was glad to see the group moving ahead.

"Despite our differences, we're all pulling together," said King, whose firm owns approximately 70 voice mail systems. "I'm encouraged that we'll meet our goals."

Those in favor of an all-digital specification, which could later become part of a voice mail interconnection standard under the auspices of an official standards body, argue that communications technology in general is moving from analog to digital.

"We're talking about having a specification in six months but not having it implemented in products [until] a year after that," said David Weinstein, director of marketing at Centigram Corp., a San Jose, Calif.-based voice mail vendor. "The communications environment will be that much more oriented toward digital communications by that time."

Vendor acceptance

Vendors will probably initially support the AMIS protocol through adjunct devices to their voice mail systems, but eventually they will integrate the technology into their systems, Weinstein said.

A digital specification has advantages over an analog standard in that digital transmission of voice messages provides users with better sound quality, said Roger Benson, technical specialist at Eastman Kodak Co. in Rochester, N.Y., and a member of the AMIS steering committee.

"With analog, the quality of a message can get pretty bad after the second hop," said Benson, whose company has some 28,000 voice mail users worldwide. "Right now, we're having this problem in sending messages to [West] Germany because of the phone lines."

A digital specification also allows for development of a more robust protocol that could allow users to send more than just voice messages, King said. The digital specification could, for example, include X.400 specifications so that users can take advantage of emerging voice mail and electronic mail integration applications, King said.

Proponents of establishing an analog specification say developing a digital standard will be difficult. An analog standard makes sense for users that have only a few voice mailboxes and that rely on analog dial-up lines to send messages, he said.

"I wouldn't want to spend $20,000 for an analog voice mail system at a small location and then have to pay $20,000 for a protocol box to allow for digital communications," King said.

Users interested in joining AMIS should contact Hatfield Associates at (303) 442-5395. Users must pay a $2,500 fee to join.

AT&T introduces private packet service

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chronous and synchronous protocols, including IBM's 3270 and Synchronous Data Link Control protocols, Reiher said.

Customers can manage their networks from an on-premises AT&T-supplied Work Group System 6386. This allows users to pinpoint problems with the network. AT&T employees at serving offices receive the same network updates and respond when trouble is signaled.

From the workstation, a customer can manage the packet assembler/disassembler equipment, which can be located either at the AT&T serving office or on the customer's premises. Users can set a profile of transmission lines by identifying, for example, where they are located, what speed they are running at, what protocols they are supporting and acceptable alarm thresholds. The user's workstation will be connected to the AT&T office via a private 9.6K bit/sec circuit.

The service also offers gateways to other X.25 networks, such as AT&T's Accunet Packet Service, as well as access to AT&T Mail, a public electronic mail service.

Optional security features include user authorization of network user identifications and passwords through User Screening Database Server software provided by AT&T, Reiher said. The software runs on an AT&T 3B2/600 minicomputer at either the AT&T serving office or user site, he said.

According to E.R. Kerkeslager, AT&T director of Business Dedicated Services, the service "meets the needs of customers whose data usage has grown beyond the point where paying for public packet networks makes economic sense."

AT&T's Reiher acknowledged that private network users want total control of the network and that giving up control of the switch is a trade-off with the new AT&T service. But around-the-clock maintenance provided by AT&T should offset the loss, he said.

Because AT&T has yet to file a tariff for the service, pricing is unclear. The company said it plans to charge a flat monthly rate based on the dedicated components — switching, transmission and protocol-conversion equipment — that customers choose.

The service is expected to be available in the third quarter of 1989.

Analysts said the new AT&T service is similar to other vendors' virtual packet net services. It will be difficult to gauge the significance of the offering until AT&T files a tariff, they said.

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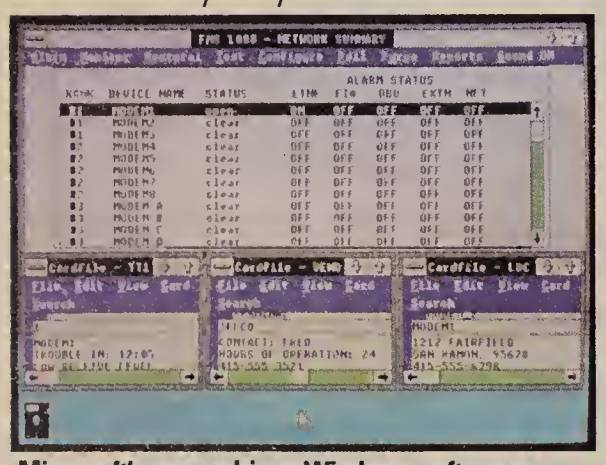

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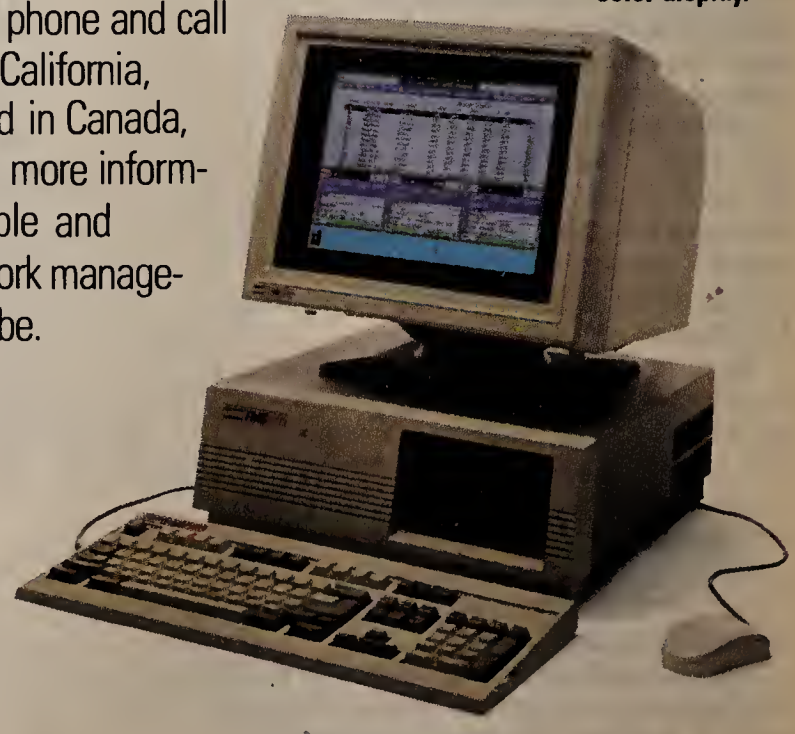

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